JAN 1
NO DEC BER 194
BUL
ETY OF SPITAL AC
NUM

AS *The President* SEES IT

I feel quite flattered and encouraged about several things. One is the fact that I know for certain that some people read this column, and I have the proof in form of five requests for blueprints of the vial washer, one comment on patient-day drug costs, one comment on the use of technical personnel in pre-packaging of stock, and one comment on my eight day week. Even though they represent only 0.5% of the total membership, these replies prove my efforts are not wasted.

In a serious vein, however, I hope that the entire membership reads this column as a personal bimonthly message to you and you and you from your President. I have tried to present matters that are of interest or value to the activities of our SOCIETY in an attempt to keep the membership informed and to provide a closer bond between thee and me. I hope that in some small way I have succeeded in accomplishing this necessary liaison.

POLICY COMMITTEE MEETING

Another thing that is encouraging is that on December 10 there was a meeting of the Policy Committee of the Division of Hospital Pharmacy, held at the headquarters building. Many important matters were discussed and decisions obtained.

A report from the Director of the Division showed that the Division is carrying out various routine functions and other matters assigned to it at a previous meeting of the Policy Committee. The Division's staff is accomplishing many things for our SOCIETY and taking care of the majority of SOCIETY correspondence. At this point your President went on record as stating that it would be impossible to take care of the greatly enlarged correspondence without the services of the Division.

An outstanding part of this meeting was the kindly enthusiasm for pharmacy exhibited by the two hospital administrators, Sister Adelaide and Dr. Cadmus. Hospital pharmacy is fortunate in having these two as the Hospital Association representatives on the Policy Committee. We are also fortunate that Dr. Cadmus is chairman of the American Hospital Association Pharmacy Committee. With his enthusiasm, this committee should prove very active this year and make good progress.

EXECUTIVE COMMITTEE MEETING

Rumor has it that this year we held the first official meeting of the Executive Committee of the SOCIETY, at which all except one member was in attendance. Dr. Fischelis, in calling the Policy Committee meeting for December 10, felt it important to hold an Executive Committee meeting the following day in order to act upon matters presented at the Policy Committee meeting. This could not have been accomplished without the Division subsidizing the expenses of travel for the several Committee members. We shall remember this as a significant contribution of the Division of Hospital Pharmacy to the SOCIETY this year.

At this Executive Committee meeting, there were many important matters discussed and decisions obtained. One of these concerned matters of vital importance to the future of our organization. It is impossible to explain this at the present, sufficient to say that the January-February 1950 BULLETIN should contain information of interest to the total membership, that very definitely affects the rate of progress for hospital pharmacy and the development of our SOCIETY.

I feel positive that I was in an enviable position at this Executive Committee meeting. Here I was sitting at a conference table with pharmacists from all parts of this great nation. It would be difficult to obtain a more significant or representative group of persons interested in developing hospital pharmacy practice than our group as follows: Dr. Robert P. Fischelis (representing the Division of Hospital Pharmacy and the American Pharmaceutical Association), Sister M. Junilla, Gloria Niemeyer, Commander W. Paul Briggs, I. Thomas Reamer, Don Francke, Robert Cathcart, Walter Frazier and Dr. W. Arthur Pur-

dum. I trust that the work produced and decisions reached at this meeting will establish the precedent and necessity for holding future meetings of the Executive Committee.

EXECUTIVE COMMITTEE MEETING WITH THE A.PH.A. COUNCIL

On January 6, 1950, the American Pharmaceutical Association Council has invited a representative group from our Executive Committee to meet with it to discuss the future development of the Division of Hospital Pharmacy. This is the first such opportunity we have had to present our cause. From the Policy Committee and Executive Committee meetings, I denoted an optimistic feeling on the part of those "on the inside", that leads me to look forward to this meeting with high hopes for producing what many of us have long desired.

I have been critical of certain aspects of Division formation and action since before the Milwaukee Convention, at which Convention the members saw the unveiling of the Division of Hospital Pharmacy. I have always felt that my criticisms were justified and constructive for hospital pharmacy. I won't question as to whether this has helped our cause, but I hereby proclaim cessation to my criticisms of Division policy and hope that all others will follow. From what I know at the moment (and won't tell) and from what I anticipate to happen, we should all take pen in hand and write a letter of thanks to the A.Ph.A.'s Council for taking a chance on us several years ago and turning back to hospital pharmacy the funds it was contributing in form of membership dues in the A.Ph.A. and forming a Division of Hospital Pharmacy within the structure of the A.Ph.A. I sincerely believe we are on the verge of one of the most progressive moves in our history, a move that should do much good for hospital pharmacy practice and for pharmacy in general. Again, thanks to the Council for taking a chance on something that many of us never thought would be workable.

THAT WORD "EMASCULATE"

In a paper entitled "Practical Experience - A Historial Review"*, Dr. Robert Swain, Editor of Drug Topics and one of the outstanding men in present-day pharmacy, stated, "practical drug-store experience has been further emasculated so as to permit six of the twelve months to be served in hospital pharmacy." In my position as your President, I received several letters and phone calls questioning this as a statement derogatory to hospital pharmacy.

The following excerpts from correspondence with Dr. Swain justify my contention that he is favorably impressed with our SOCIETY and with hospital pharmacy, and should set the matter straight:

> "My premise, as exemplified in the article, dealt only with retail drug store experience, and I tried to show that practical drug store experience, as an essential educational factor, had finally given way to formal education in colleges of pharmacy. I then made the point that the one year of drug store experience which was regarded as the irreducible minimum, has now been 'emasculated' by permitting one-half of this experience to be obtained in a hospital pharmacy. By this, I merely meant to indicate that retail drug store experience as an educational factor, was fighting a losing battle.
>
> "I regret that I used the word 'emasculate' in order to avoid the impressions which you gained from the article. There can be no doubt that, from the standpoint of basic worth, six months experience in a hospital pharmacy far transcends that generally obtainable in the great majority of retail drug stores.
>
> "But, the mere fact that six of the twelve months may be obtained in a hospital pharmacy, is just one more bit of proof that practical retail drug store experience grows weaker year by year, as a requisite for pharmaceutical registration."

I am certain that all of us who read Drug Topics and know of Dr. Swain, are appreciative of his courtesy in supplying this explanation.

1950 CONVENTION OF OUR SOCIETY

The Convention Committee with Robert Cathcart as chairman is preparing a program for the annual meeting of our SOCIETY to be held in Atlantic City the week of April 30, 1950. The first meeting is in the evening of Sunday, April 30, when the House of Delegates convenes. It is hoped that a report from each affiliated chapter will be sent to the Secretary in sufficient time for duplication and presentation to the members present.

Mr. Cathcart and his committee have a tentative program planned. They are appealing to the membership for recommendations of material for panel discussion and also for a few technical papers to be presented at this meeting. My opinion is that you have less trouble convincing your "boss" to pay expenses of your convention trip if you tell

* Journal of the American Pharmaceutical Association, Practical Pharmacy Edition, (October 1949)

him you are presenting a paper at the meetings. Why not try it?

Mr. Cathcart and your President, both being Philadelphians, are hoping that you who come from afar, will allow us to "show you the town" enroute to and from the Convention. Philadelphia is the birthplace of liberty, the birthplace of the American Pharmaceutical Association, the birthplace of yours truly (of no significance), and has many points of historical and other interest for all to see. Plan to come a day early or leave a day later so you may visit with us in Philadelphia. Meanwhile, PLEASE consider making a contribution toward the Convention program. (Deadline for preliminary program announcements is January 14.)

1950 CONVENTIONS (HOSPITAL, PHARMACEUTICAL, MEDICAL)

In the previous issue of this BULLETIN there was a photograph and write-up of the display prepared by the Division of Hospital Pharmacy. This display is now available for showing under affiliated Chapter sponsorship, at the several state and regional hospital, pharmaceutical and medical conventions.

We need an all-out effort to present the best in hospital pharmacy to the several groups attending these conventions. We need a continual plan whereby we sell ourselves and our services to these persons. Every chapter can cooperate by displaying either the large three panel exhibit or the smaller exhibits presently being prepared by the Convention Committee. Contact the Division of Hospital Pharmacy for loan of these displays.

AFFILIATED CHAPTERS

This year, the Michigan Society of Hospital Pharmacists, under leadership of President Adam Stark, is accomplishing an outstanding piece of work. Besides actively pursuing non-members to join, they are actively engaging in meetings of a high professional calibre. To justify these statements, let me present the following paragraphs abstracted from the minutes and reports of this group:

"A number of suggested projects for M.S.H.P. members was proposed by Mr. Stark at the first meeting of the fall season.

1st. To increase the membership of M.S.H.P., A.S.H.P. and the A.Ph.A.

2nd. To secure a permanent member of our group on the State Board of Pharmacy.

3rd. To arrange for one state-wide meeting of the Michigan hospital pharmacists.

4th. To fulfill the Policy and Long-Range Planning Committee's recommendations and commitments.

5th. To establish a permanent meeting place."

You will also be interested to note the report of the Michigan Chapter's Committee on Long Range Planning and Policy which appears on page 296 of this issue of THE BULLETIN.

What of the other affiliated chapters? I would greatly appreciate the Secretary of each Chapter sending a statement to me showing similar professional activity of the group. MAYBE there are other Chapters doing as good a job this year.

COMMITTEE ACTIVITIES

If anyone feels that he has an exceptionally good form for use in the several phases of narcotic drug control in the hospital, please send same to Mr. Milton Skolaut, Chairman of the Committee on Narcotic Regulations. The Committee is attempting to standardize these forms and have a standard one approved by the Federal Narcotic Bureau.

There should be an announcement elsewhere regarding appointment of a Committee on Parenteral Containers under Chairmanship of George Phillips, University Hospital, Ann Arbor, Michigan. Formation of this committee was recommended at the Chicago Institute to attempt standardization of parenteral fluids containers and closures. Since George Phillips has done so much work on the project to date, he was appointed chairman. Volunteers are needed throughout the nation to recommend certain features for inclusion in the standard containers and closures. Just by chance, the British are concerned with the same project and we are planning for international cooperation on this project insofar as exchange of information is concerned.

SEASON'S GREETINGS

I take this opportunity to extend season's greetings to every member of the SOCIETY, with a prayer and hope for professional success, peace and joyful living during the year 1950. May God invoke His blessing upon you all.

Cordially,

Herbert L. Flack

THE BULLETIN is published bimonthly by the American Society of Hospital Pharmacists, a national organization devoted to the profession of hospital pharmacy, dedicated to the interests of the hospital pharmacist, and pledged to cooperate with the American Pharmaceutical Association with which it is affiliated.

Contributions of articles by hospital pharmacists, or by others interested in the progress of this important branch of the public health profession, will be accepted if they are of general interest to those in hospital pharmacy. The editors reserve the right to revise all material submitted, if necessary.

The American Society of Hospital Pharmacists and the American Pharmaceutical Association assume no responsibility for the statements and opinions advanced by contributors to THE BULLETIN. Views expressed in the editorials are those of the editor and do not necessarily represent the official position of the American Society of Hospital Pharmacists.

Volume 6 - Number 6

November-December 1949

DON E. FRANCKE
Editor

GLORIA NIEMEYER
Associate Editor

ASSISTANT EDITORS

Sister Mary Etheldreda
Herbert L. Flack
Leo F. Godley
James Inashima
Albert P. Lauve
George L. Phillips
Evlyn Gray Scott
Anna D. Thiel
Eddie Wolfe

EDITORIAL OFFICE
University Hospital
Ann Arbor, Michigan

PUBLICATION OFFICE
American Pharmaceutical
Association, Washington, D. C.

Copyright 1949 by the
American Society of
Hospital Pharmacists

CONTENTS

As The President Sees It . . . . . Inside Front Cover

Correspondence 268

Editorial 269

Research in Hospital Pharmacy 270
Dr. Elmer M. Plein

Tibione 276

Manufacturing Controls in the Hospital Pharmacy 278
Dr. Carl J. Klemme

Glycerin Substitution in Phenobarbital Elixir U.S.P. XIII 284
S. J. Dean and D. C. Brodie

A New Disposable Automatic Injection Device 286
W. W. Hosler and Walter F. Wargell

Book Reviews 290

Time-Saving Devices for the Hospital Pharmacy 291

Timely Drugs 295

Therapeutic Trends 297

Internships in Hospital Pharmacy 299

Notes and Suggestions 302

Current Literature 304

Positions in Hospital Pharmacy 305

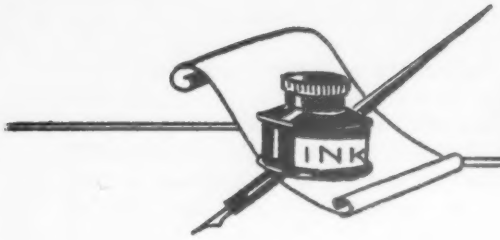
Organization News 306

News Items 309

New Members 313

Index, 1949 314

Constitution and By-Laws . . . . . Inside Back Cover



CORRESPONDENCE

Dear Sirs: Thank you very much for a copy of THE BULLETIN of the American Society of Hospital Pharmacists which I received today. I wish to commend you on what impresses me as a very fine editorial job. There is a good deal of worthwhile information in it and I will recommend it to the Department of Pharmacy.

Norman C. Carey

Legal Department
The White Cross Hospital
Columbus 8, Ohio

Dear Sirs: I wish to become a member of the American Society of Hospital Pharmacists. Will you please send me the necessary information. We also wish to receive copies of THE BULLETIN.

Gilbert Colina

Mercy Hospital
Charlotte, N. C.

Dear Sirs: We at this hospital look forward to your most helpful "Notes and Suggestions" column in THE BULLETIN. We have for the past few months been trying to locate a source for Propylene Glycol. To date we have been unsuccessful in this locality. We would most certainly appreciate it if you would be so kind as to furnish us with the names of the various sources for same.

Arvon J. Jones

Veterans Administration Hospital
McKinney, Texas

Editor's Note: Propylene Glycol is available from a number of sources including: Carbide and Carbon Chemical Corporation, 30 E. 42nd St., New York 17, N. Y.; The Dow Chemical Company, Midland, Michigan; Fallek Products Co., Inc., 165 Broadway, New York 6, N. Y.; and McKesson & Robbins, Inc., Chemical Division, 155 E. 44th St., New York 17, N. Y.

Dear Sirs: I have received several interesting applications for the position of chief pharmacist in our hospital as a result of the advertisement in THE BULLETIN. If you have an extra copy of the issue containing our notice available, please send it to me.

W. C. Perdew, Superintendent

Bronson Methodist Hospital
Kalamazoo 5, Michigan

Dear Sirs: I have just seen a copy of THE BULLETIN of the American Society of Hospital Pharmacists and find it so excellent that I would like to receive it regularly at our library. We can use it in connection with our classes in pharmacology.

Madeleine M. d'Urbal, Librarian

Sacred Heart School of Nursing
Spokane, Washington

Dear Sirs: I am a registered pharmacist operating a prescription store in Charlotte, North Carolina. However, at the present I am at Percy Jones General Hospital at Battle Creek, Michigan on a short tour of duty and I will be back in Charlotte in about two weeks. We have THE BULLETIN of the American Society of Hospital Pharmacists here and I would like to subscribe for the above for one year beginning with the September-October issue of 1949. Enclosed please find a money order for $3.00 which I understand is the required fee. If there is any other charge please let me know.

Robert L. Rimmer

Charlotte, North Carolina

Dear Sirs: Thank you for sending me the past issues of THE BULLETIN. They have provided me with a large assortment of new thoughts which I hope in time to use in my institution. With the many journals that are available to the hospital pharmacist, I believe that this publication "tops" them all.

Edward F. Croumey

Bangor, Maine

EDITORIAL

HILL-BURTON ACT AFFECTS HOSPITAL PHARMACY

The program for the construction of new hospitals has been given a big swing upward by the approval of amendments to the Hospital Survey and Construction Act (Hill-Burton Act) which doubles the amount of federal money to be used in non-federal hospital construction -- from $75,000,000 to $150,000,000. In addition, the revised act extends the program through the fiscal year 1955, gives the states more freedom in administering the program and doubles the minimum amount of money any state may receive in a year--from $100,000 to $200,000. The provisions of the act have been broadened to allow some hospitals to receive as high as two-thirds of the cost of construction, instead of the one-third limit under the original act. Construction of many more hospitals and the chances of communities to receive a larger share of federal funds have been greatly increased.

Also, the new amendments provide a grant of $1,200,000 for special studies toward the improvement of any phase of hospital service. As one of the hospital services, pharmacy is eligible to participate in this grant. It is probable that the Division of Hospital Pharmacy will submit plans for one or more projects.

Passage of this legislation again brings sharply into focus the great need for accelerated activity on the part of hospital pharmacy to prepare itself to assume its rightful place in this vast program for the extension of medical care. Inevitably, there will be more hospital pharmacies built, greater demands for well-trained pharmacists and expanded opportunity in this increasingly important field of pharmacy.

To fulfill these needs, increased activity from all of us is required. We must have more young people trained and experienced in the field of hospital pharmacy. It is only within the relatively last few years that recent graduates have objectively selected hospital pharmacy for their career and have been willing to obtain the training necessary to work progressively in this field. We need more career personnel in our specialty for upon them rests the promise of future progress. Additional internship programs are needed to train these young people. The time has now come for the Society and the Division of Hospital Pharmacy to promulgate well thought-out standards for internships in order to assure a proper level of training.

However, it will be several years before the impact of well-trained interns will be felt in hospital pharmacy. In the meantime, there is a good opportunity for all of us in the field to improve it. We can do this by constantly raising the standard of pharmacy practice in our own institutions, by being alert to what others are doing and by developing and carrying out a specific program for our own departments.

On a national level, the Division of Hospital Pharmacy will serve an increasingly important function as a clearing house for knowledge and ideas in the field of hospital pharmacy. In addition to its important responsibilities regarding THE BULLETIN, the institutes and membership activities, the Division will increase its scope and plan and execute many of the studies in hospital pharmacy which have so long been needed.

All hospital pharmacists now in practice should take courage in the fact that the future looks brighter. Those pioneers in the field who have devoted a lifetime of service, who have persisted patiently and who have contributed so much, should be heartened that their patience and work appear to be bearing fruit. It is through their efforts to create and build a vital organization of hospital pharmacists that the Society has waxed so strong. Where formerly there were many individuals working hard for their profession, now there is the power of teamwork to do more and greater things.

RETROSPECT AND PROSPFCT

In that short interlude between the old year and the new, rather a fantasy than a reality, everyone reflects, if only for a moment, on the past and speculates briefly on what the New Year will bring. In this twinkling of time each of us might well ask himself "What have I contributed to my profession in 1949? What endowment shall I make in the New Year?"

It is at this brief interlude when for a moment we may view the world as a moving stage and perceive that we have a part to play, not only in life in general, but also in the growth of our chosen profession. If we do not contribute according to at least some measure of our abilities and opportunities, can it be said that we have played our part with integrity?

What can we do that our profession may gain and by this doing benefit all? More can be done by the many individuals in all hospitals by thinking, planning, working and doing things to make their departments the true reflection of what hospital pharmacy should be, than by all the efforts of the Society and its national leaders. It is not so much national leaders that we need as it is large groups of pharmacists striving to improve from day to day and from year to year, their service as an arm of the public health. It is the total of these efforts more than anything else which reflects the stature of our profession. There is a yawning chasm between what hospital pharmacy is and what it can be--if only each of us would make a plan for our own department and execute it.

RESEARCH IN HOSPITAL PHARMACY

By Elmer M. Plein, Ph.D.
University of Washington College of Pharmacy
Seattle 5, Washington

Presented at the California Institute
on Hospital Pharmacy - June, 1949

In discussing the subject of research in the hospital pharmacy it becomes necessary first to define the term "research" and then to apply the term and its definition to those activities which do or which might exist in the hospital pharmacy. There are differences of opinion about what research is and about what the limits of its definition should be. People in general seem to know what sort of work is done by tradesmen and by most professional men, but they are not familiar with the sort of work a researcher does. Even those in research sometimes find it difficult to agree on a concise definition of the term, and often they disagree on the limits of the definition of research.

Research is sometimes defined as productive scholarship. It consists in searching for new knowledge or in attempting to improve something. There are many parallels to it and even actual instances of it in everyday life. Almost everyone is curious enough to search for new information on subjects in which he is interested.

The Royal Society of London, founded in the seventeenth century, and one of the first organizations devoted specifically to research, proposed at one of its early meetings several subjects for investigation. Among these topics were such as the following: Determination of the forces necessary to break wires of different metals all of the same size, determination of pressures necessary to compress air into smaller volumes, and the determination of sexes, if there be such, of trees and other plants. All the subjects suggested were those about which the members knew nothing. They were obliged to experiment in the field about which they wished to learn.

Research consists of experimentation under carefully controlled conditions. It may comprise the collection of data through perhaps accurate measurements of the orbits of stars, the determination of the weights or sizes of the particles of a system, or the computation of the number of customers entering a given pharmacy. Research may consist of the testing of ideas already advanced. Galileo dropped various substances from the leaning tower of Pisa to disprove the belief that heavy bodies fall faster than light ones. Research may consist of efforts to improve something, whether it be a machine, an instrument, or a pharmaceutical. James Watt, with his experimentation, transformed the imperfect steam engine into an effective machine. Optical instruments have been improved tremendously through the simple coating of the lenses. New medicines and better pharmaceuticals are constantly being produced.

Some individuals would distinguish between "research" and "development". By "research" they would refer to the experimentations involving the higher planes of science--the newer or more recent ideas. By "development" they would mean experimentation designed to improve the arts through the use of the more fundamental research.

What has already been said concerns pure and applied research. C. E. K. Mees[1] states that whether research is pure or applied is "merely one of intention". The sole intention of the researcher in pure science is to advance human knowledge simply for the sake of knowing. The intention of the explorer in applied research is to convert discovered truth into some practical usefulness or to both discover something new and apply it in a practical manner.

Sir Humphry Davy did pure research when he, with the help of Michael Faraday, investigated the electricity of the torpedo fish, and when he burned a diamond to prove it was almost pure carbon. However, when he investigated astringent vegetables for the tanning industry and when he studied mine explosions and invented the miner's safety lamp, he dealt with applied research.

The methods employed by the investigator in applied science are no different than those employed by the investigator in pure science. Perhaps it is merely the use which is expected to be made of the results which determines the type of research in question. And yet in spite of the intentions, the difference between the two forms as far as ultimate results are concerned may not be very great. An investigation with pure scientific intent may become of great practical importance and it sometimes happens that the results obtained through applied research assume scientific value.

Mendeleeff devised the periodic classification of chemical elements, Anthony Leeuwenhoek experimented in making microscopes for looking at microbes, and the Curies isolated radium all in the interest of pure science. Their discoveries, however, were soon put to practical usage.

On the other hand, Pasteur, with Roux and Chamberlain, was searching for a practical means of curing chicken cholera when he discovered the principle of immunization which has proved of scientific as well as practical value. Pasteur undertook an investigation to cure fermentation troubles in the alcohol industry, and it led him to fundamental contributions to the science of fermentation.

In nearly every field of knowledge are wide gaps. Rarely can an investigation in applied science be completed without doing something which could be classified as pure research. Everyone who has had occasion to look up some physical constant which proved to be unavailable has experienced this problem. Before he could proceed with the problem at hand, the particular physical constant had to be determined.

In Flexner's "Usefulness of Useless Knowledge"[2] are some interesting facts about pure and applied research. Someone had remarked to Flexner that Marconi was regarded as the most useful worker in science in the world. Flexner's reply to the statement was that Marconi's contribution to the pleasure we derive from wireless and radio was practically negligible. The real credit for everything done in the field of wireless belongs to Clark Maxwell who, in 1865, carried out certain calculations in magnetism and electricity. Other discoveries supplemented his work during the next twenty years. Finally, in 1887 and 1888, Hertz solved the remaining problem--detection and demonstration of the electromagnetic waves which are carriers of wireless signals. Neither Maxwell nor Hertz had any concern about the utility of their work. It remained for Marconi to invent only the last detail, the now obsolete receiving device called a coherer. Maxwell and Hertz invented nothing, but their apparently useless theoretical work was seized upon by Marconi, a clever inventor with no thought but use.

In his "Reminiscences" Wilhelm von Waldeyer tells the story about one of his students, Paul Ehrlich, who seemed to pay little attention to instruction, but who nevertheless directed his curiosity to long hours of observation with the microscope. Ehrlich's desk became spattered with various colors, but Waldeyer allowed the student a free hand in his unusual investigation. As a result of this work, Ehrlich later developed the staining of blood film with dyes for the purpose of studying blood morphology, and a fellow student, Weigert, applied staining methods to the differentiation of bacteria. Thus the apparently unimportant attempt in Waldeyer's laboratory to satisfy one's (Ehrlich's) curiosity--an attempt simply to gain more knowledge without thought of use--has developed into very important procedures in laboratories involving microbiology and blood analysis.

Hexachlorobenzene has been known since 1825, but only recently was its use as an insecticide discovered. In 1874 Othman Ziedler synthesized dichloro-di-phenyl-trichloroethane, wrote up the results and set them on the shelf as nothing more than data about a new chemical with no immediate use. During the past several years the product now called DDT has been used extensively as an insecticide. Para-amino-benzene sulfonamide was first reported in 1908, but its use as an anti-infective was not known for about twenty-five years. These substances are among the many which were first made in pure research. They were useless items until their usefulness was discovered.

Some of the traits of the researcher have already been intimated. He must of course be curious,--curious enough to bend his efforts with enthusiasm toward finding the answer to some problem of interest to him. The researcher must possess a degree of imagination and the courage to stand by the theories he proposes. He must experiment persistently and patiently until the problem is solved and tested honestly to establish the validity of its solution.

Let us assume an individual is ready to select some problem, for example, the assay of a penicillin-containing product, with the idea of improving some particular procedure. This researcher must first have interest in the problem. He must thoroughly test the method in order to become familiar with the intricacies of the procedure. He must show a genuine curiosity to get to the very bottom of the problem. Curiosity sufficient to search out only half truths is not adequate. In Stanley's "In Darkest Africa" he describes the use of muslin screens to ward off malarial effects. Stanley might have discovered the fact that malaria is carried by mosquitoes had his curiosity been deep enough. Our researcher developing his improved method for the assay of penicillin must use his imagination and do a certain amount of theorizing. His first theories might not be correct, but at least he should have the courage to defend his theories and prove or disprove them by persistently and patiently testing them. Ross and Grassi finally solved the problem of malaria through their persistent work. Ross advanced the incorrect theory that malaria is contracted by drinking water contaminated with malaria germs from dead mosquitoes. Finally he did arrive at the fact that the bite of the living mosquito was the correct answer. The researcher must experiment and carefully observe the results because experiments often yield unexpected results. William Perkin, attempting to prepare quinine from aniline, instead made the first of the aniline dyes, mauve. Pasteur injected cholera germs into a series of chickens, among them two which had previously recovered from cholera. All the chickens

died except the two birds, and this observation led Pasteur to the principle of immunization. These latter experiments which produced unexpected results emphasize the fact that our researcher's experiments must be carefully controlled. Patience in research is necessary. It took Ehrlich seven years to discover 606. Pasteur worked five years to find a vaccine for rabies. Our researcher, in improving the assay method, will find, when his ideas are beginning to unfold, that certain obstacles suddenly develop. Persistence is often necessary to push these obstacles from the path leading to success. Charles F. Kettering has said, "The only time you don't want to fail is the last time you try." Enthusiasm about his work is necessary to keep our researcher at his problem of improving that assay. The earliest record of enthusiasm about research is probably that which concerns Archimedes. All of you remember his running naked into the street and shouting following his discovery of Archimedes' Principle which he used to determine whether the king's crown was actually made of gold. Such display of enthusiasm is not advocated for our modern researcher, but, according to Emerson, nothing great was ever achieved without enthusiasm. Justus Liebig and Gay-Lussac used to dance around the table when they discovered something interesting. Thomas Edison shouted "hurrah" after a successful discovery. Charles Darwin became so interested in his work when first studying birds that he wondered why everyone did not take up a study of ornithology. Finally our researcher must be honest. All the controls of his experiments and the tabulated results must be authentic in order that anyone else might be able to use the work in laboratory testing.

Now that it has been established what research is and why one does research, let us turn briefly to the selection of fields of research and the selection of problems within the field. We are primarily interested in research which can either be accomplished within the hospital pharmacy or which can be utilized within the hospital pharmacy.

Some of our colleagues in the profession have criticized each other for overstepping the boundaries of research. Overstepping in this sense means, for example, that a pharmaceutical chemist had done research in practical pharmacy, that a pharmacognocist had chosen a chemical problem, that a practical pharmacist was researching in pharmaceutical chemistry. Why all these small arguments--isn't it still pharmacy? One of my colleagues enjoys picking up some problem involving methods about which he knows little. He enjoys studying to make himself qualified to carry to completion the particular study he has selected. He and I agree that research is where you find it--that if one sees a beach-head (of research) onto which he can land, he is justified in undertaking such a task just so he is qualified or makes himself qualified to do the work.

It has been intimated that the fields of research are varied. Research is not restricted to the sciences. The cook does research when he attempts to develop entirely new recipes or to improve old ones. We find an article on how to make candy in the Journal of Physical Chemistry. The man who gathers information as to the number of people passing a given store building is doing research perhaps for a concern who contemplates opening a new drug store at this location. The explorer who visits new territories, the man who paints a picture, the woman who writes a play, the man who composes a piano prelude--all these are doing research. The Research Society of the University of Washington has, for its members, scholars from almost every department and college on the campus.

How many times have you heard a person say when discussing a piece of research that has just appeared in print, "Why didn't I think of that"? It is said that Moses G. Farmer, a researcher in the electrical field, could not sleep for a week after he heard that Alexander Graham Bell had invented the telephone. He claimed the problem had presented itself to him a dozen times in the ten years preceding Bell's invention, but said he was "too blind to see it".

There are perhaps various reasons, says Paul de Kruif, why people ask the question, "Why didn't I think of that?". Once a problem has been solved in its entirety, it is simple to see the answer. The few existing unassembled facts are so baffling to these people that they did not see the possibilities of solving the problem. A second reason is that most individuals have only a limited number of original ideas. A third reason is lack of sufficient imagination to see the need for new things.

Thus far nothing has been said about the possibilities of a cooperative research program in the development of an industry. The development of the automobile is such an example which, traced from its beginning, involved both pure and applied research. It is not an invention in itself. It came into being as a result of many prior inventions and discoveries. We need not discuss the many well known subjects and phases of research necessary for the evolution of the automobile to its present status.

Since the various phases of what research is have been discussed, perhaps something should be said about what research is not. Research consists in the search for new knowledge. It does not include the gathering of information about an already known product. Such determinations would be merely testing. The equipment in a testing

laboratory and in a research laboratory are much the same. In fact the same measurements may be taken in each laboratory. The testing laboratory, however, deals only with the substances already known. The various properties have already been determined, the testing laboratory merely tests another lot of the material and compares the measurements with those standards previously set up. The research laboratory makes measurements and determines properties not previously known. A student in history studying in the already broken paths does no research, but if he searches through original records not previously read, he is doing research.

Let us consider some of the research done in hospital pharmacies and research which might well have been accomplished in hospital pharmacies during the past year and a half. It is not possible to discuss all the research done in that period of time. Examples of the various phases of research will however be considered. Now it is true that the equipment available in the smaller hospitals will be inadequate for some of the types of problems discussed. Even the larger hospitals may not possess certain specialized equipment. It may, however, be advisable for the hospital to procure such special equipment if the need and degree of use of the instruments can justify its purchase. Many of the problems discussed, however, can be investigated with very ordinary and common equipment.

It was pointed out previously that the boundaries of pharmaceutical research are often discussed. It was also pointed out that research in pharmacy is pharmaceutical research regardless of whether it involves a considerable amount of technics used in microbiology, in chemistry, in physics, or in some other subject. When the following pieces of research are discussed, then, they will be classified according to the major technics involved.

Microbiology has figured in many pieces of research on penicillin. Pratt[3] and his coworkers found that the addition of cobalt chloride to test agar used in assaying penicillin by the cylinder-plate technic caused pronounced increases in the diameters of inhibition zones formed on plates. The effectiveness of the penicillin was increased from two-to eight-fold. Vitamin K_5 was also found to enhance the activity of penicillin as much as 100 times depending upon concentrations of the vitamin and penicillin and upon the microorganism used in the assay by Pratt[4] and his coworkers. Guiteras[5] has developed a porcelain mold for preparing agar-cup plates for penicillin assay. Pratt and his coworkers[6] used Bacillus subtilis in the three-hour cylinder-plate assay of penicillin. The stability of penicillin in aqueous solution was studied by Macek and his coworkers[7]. They found solutions of crystalline penicillin G sodium less stable than solutions of partially purified penicillin sodium. Their studies also showed no significant difference in stability of penicillin G sodium in water, physiological salt solution, and 5% glucose solution. Culter[8] studied the stability of penicillin ointment and found among other things that water, carbowax, zinc stearate, and dried aluminum hydroxide gel hasten the decomposition of penicillin. These latter two papers are of significant interest to the dispensing pharmacist.

Microbiology has also been used in the study of the stability of bacitracin[9] and the substance found to parallel quite closely the stability of penicillin. Again a problem of great interest to the dispensing pharmacist is cited.

Lawrence[10] studied by means of microbiology the inactivation of the germicidal action of quaternary ammonium compounds by anionic detergents and soaps. He found that they failed to completely inactivate the surface-active cationic detergents. Suramin Sodium, however, was found to be quite effective.

Ward[11] reported the in vitro fungistatic action of some nitrofuran derivatives. This work was done with technics of microbiology as was also the determination of the efficiency of some organomercurial compounds by Morton, North, and Engley[12]. This work was reprinted from the Journal of the American Medical Association in THE BULLETIN of the American Society of Hospital Pharmacists.

Practically all the investigations on pyrogens involve microbiology. Ott[13] offers a quantitative assay for pyrogens in water and biological products. He also suggested a standard "pyrogen unit". Taub and Hart[14] found that by boiling solutions with 0.1% hydrogen peroxide for one hour pyrogens would be destroyed. Residual peroxide can be removed from water and saline solutions by means of manganese dioxide and from glucose solutions by activated charcoal. The subject of pyrogens is of special interest to the pharmacist who prepares parenteral solutions.

A pharmacognostic study of the seeds of Plantago purshii and Plantago aristata and a comparison with the N.F. VIII Plantago seeds was made by Neva and Fischer[15]. Mucilage-forming capacity of the seeds was determined also and found to be above the minimum requirements for the official seeds.

In toxicology Fitzhugh and Nelson[16] have reported on the chronic oral toxicities of surface agents, and Thompson and Werner[17] have determined the chronic toxicity of decapryn succinate.

In pharmacology there are many investigations reported. Every new chemical which shows promise of use, whether the use be in medicine or in the arts, is investigated for its pharmacological properties. An example in this field is Haley's[18] study of dl-desoxyephedrine hydrochloride.

A few chemical investigations might be given as

examples of that particular field in which a good deal of research has been done. There are syntheses of countless compounds such as para-aminosalicylic acid hydrochloride by Wenis and Gardner[19] and tetraiodinated Congo Red by Martin and Bang[20]. A titrimetric method for estimating penicillin was reported by Wright and Grove[21], and Garlock and Grove[22] devised a means of determining penicillin quantitatively with the infrared spectrometer. The effect of 8-hydroxy-quinoline on the stability of Glycerite of Hydrogen Peroxide by Brown and his coworkers[23] has been particularly interesting to the dispensing pharmacist. Chemical means of assaying pharmaceutical preparations for synthetic estrogens has been devised by Gottlieb[24].

In the field of crystallography, Keenan[25] has reported the properties of a number of chemicals, and Castle[26] has investigated the optical crystallographic properties of the barbituric acid derivatives.

In manufacturing pharmacy recent literature carries a number of papers on the drying of tablet granulations by radio-frequency[27] and by infrared rays[28], improved methods of tablet coating[29], the use of microcrystalline wax in tablet polishing[30], the disintegration of compressed tablets[31], and the action of intestinal enzymes on cellulose acetate phthalate and butyl stearate enteric-coated tablets[32]. Brewer's[33] "Aseptic Operation and Control of Ampul Filling Rooms" and "Ampuls" by Yoder, Roger and DeKay[34] give considerable valuable information about the filling of ampuls. "Parenteral Fluids Prepared in the Hospital Pharmacy" by Sister Mary Clara Francis[35] and "Narcotics in Sterile Solutions" by Sister Henrietta[36] describe means of manufacturing those products. The inactivation of nutrients by heating with glucose was reported by Patton and Hill[37], a problem of particular importance in those pharmacies where nutrient solutions are prepared.

Of interest to the dispensing pharmacist are the investigations on isotonic collyria. Train[38] has written considerable on isotonic solutions for the eyes. Skolaut[39] in his "Ophthalmic Medications" presents a review of present concepts in ophthalmic solutions. Formulas are included and a number of references are presented in the bibliography. Husa and Dale[40] described the effect on pH of variations in technic, equipment, and quality of chemicals in their "Adjusted Collyria". "Levigating Agents"[41], "An Improved Calamine Lotion"[42], "Electrode Jellies"[43], and "Aromatic Elixir"[44] are of interest to dispensing pharmacists because each one of these articles contains good usable material worked out with simple equipment by research processes. There are frequent publications on incompatibilities. Numerous articles have appeared on new synthetic ointment bases, and it appears that much more research will be done on this type of product by the pharmacist because such new products are appearing on the market each month.

An important research project for the hospital pharmacist is the development of a Hospital Formulary. An excellent account of such a project and the means of carrying it to completion has been written by Francke[45].

Putting the pharmacy on a better paying basis is a problem in business administration, and we find a publication by Martha Coffield[46] on "Increasing Net Profit in Your Pharmacy". Manufacturing in a small hospital is a procedure most pharmacists prefer to avoid. Cathcart[47] has shown in his publication on "Economics of Manufacturing in a 100 Bed Institution" that certain items can be manufactured much more reasonably than they can be purchased.

The foregoing brief discussion of research in various fields is by no means complete. It was so presented merely to point out possibilities of research endeavor. Some of the problems require elaborate equipment. Many problems can be solved with simple equipment. Research possibilities present themselves daily. They may involve chemistry, pharmacology, dispensing technics, record keeping, or the improvement of some gadget used to save time in the pharmacy.

Much can be accomplished in cooperative research. Often cooperative research is interprofessional. Physicians and pharmacists often cooperate in such a program. When two or more researchers form a team to solve a problem, it usually is to advantage because the problem will likely be attacked from as many viewpoints as there are team mates. It is to be understood of course that each member of the team will carry his share of the load.

Now, in summarizing this discussion, research has been defined, the differences between pure and applied research have been presented, making useful things out of the useless has been brought out, the characteristics of a good researcher have been defined, and the boundaries or perhaps the extensive character of hospital pharmacy research has been set down.

In conclusion, let each one of us consider his contributions to research as integral parts that go to improve the welfare of mankind--to make for better living. Herbert Hoover once said, "Discovery and invention do not spring full grown from the brains of men. The labor of a host of men, great laboratories, long, patient scientific experiment build up the structure of knowledge. This adding of fact to fact someday brings forth a revolutionary discovery, an illuminating hypothesis, a great generalization, or a practical invention."

BIBLIOGRAPHY

1. Mees, C. E.: Organization of Industrial Scientific Research, McGraw-Hill Book Company, 1920.

2. Flexner, A.: Usefulness of Useless Knowledge, Am.J.Pharm. 110:399 (Sept.) 1938.

3. Strait, L. A.; Dufrenoy, J.; Pratt, R., and Lamb, V.: Enhancement of Penicillin Effectiveness by Traces of Cobalt, J.Am.Pharm.Assoc. Sci. Ed. 37:133 (April) 1948.

4. Pratt, R.; Dufrenoy, J.; Sah, P. P., and Pickering, V. L.: Enhancement of Penicillin Activity in vitro by Vitamin K_5, Ibid. 37:435 (Oct.) 1948.

5. Guiteras, A. F.: A Porcelain Mold for Aseptically Preparing Agar-Cup Plates, Ibid. 37:327 (August) 1948.

6. Pratt, R., et al: Use of Bacillus Subtilis in the Three-Hour Cylinder-Plate Assay for Penicillin, Ibid. 37:54 (Feb.) 1948.

7. Macek, T. J.; Hanus, E. J., and Feller, B. A.: The Stability of Penicillin G Sodium in Aqueous Solution, Ibid. 37:322 (August) 1948.

8. Culter, S. H.: Stability Study of Penicillin Ointment, Ibid. 37:370 (Sept.) 1948.

9. Bond, G. C.; Himelick, R. E., and MacDonald, L. H.: The Stability of Bacitracin, Ibid. 38:30 (Jan.) 1949.

10. Lawrence, C. A.: Inactivation of the Germicidal Action of Quaternary Ammonium Compounds, Ibid. 37:57 (Feb.) 1948.

11. Ward, W. C.; Prytherch, J. P., and Cramer, D. L.: The In Vitro Fungistatic Action of Some Nitrofuran Derivatives, Ibid. 37:317 (August) 1948.

12. Morton, H. E.; North, L. L. Jr., and Engley, F. B. Jr.: The Bacteriostatic and Bactericidal Actions of Some Mercurial Compounds on Hemolytic Streptococci, J.Am.Med.Assoc. 136:37 (Jan. 3) 1948.

13. Ott, W. H.: A Quantitative Assay Method for Pyrogens, J.Am.Pharm. Assoc., Sci. Ed. 38:179 (April) 1949.

14. Taub, A. and Hart, F.: Detoxification of Pyrogens by Hydrogen Peroxide in Some U.S.P. Injections, Ibid. 37:246 (June) 1948.

15. Neva, A. C. and Fischer, E. B.: A Comparative Pharmacognostical Study of Plantago Purshii R. & S. and Plantago aristata Michx. Seeds with the Present N. F. VIII Plantago Seeds, Ibid. 38:34 (Jan.) 1949.

16. Fitzhugh, O. G. and Nelson, A. A.: Chronic Oral Toxicities of Surface-Active Agents, Ibid. 37:29 (Jan.) 1948.

17. Thompson, C. R. and Werner, H. W.: Chronic Toxicity Studies on Decapryn Succinate, Ibid. 37:311 (August) 1948.

18. Haley, T. J.: A Pharmacological Study of dl-Desoxyephedrine Hydrochloride, Ibid. 37:223 (June) 1948.

19. Wenis, E. and Gardner, T. S.: The Synthesis of p-Amino-salicylic Acid Hydrochloride, Ibid. 38:9 (Jan.) 1949.

20. Martin, C. F. and Bang, H.: Synthesis of Tetraiodinated Congo Red, J.Am.Pharm.Assoc. Sci. Ed. 37:102 (March) 1948.

21. Wright, W. W. and Grove, D. C.: The Estimation of Penicillin K in Commercial Penicillin, Ibid. 37:115 (March) 1948.

22. Garlock, E. A. and Grove, D. C.: The Quantitative Determination of Crystalline Penicillin G by Infrared Analysis, Ibid. 37:409 (Oct.) 1948.

23. Brown, E. A.; Krabek, W. B.; Skiffington, R. E., and Cruickshank, G. A.: The Effect of Oxine (8-Hydroxyquinoline) on the Stability of Glycerite of Hydrogen Peroxide, Ibid. 37:34 (Jan.) 1948.

24. Gottlieb, S.: Chemical Determination of Synthetic Estrogens: II. Application to Pharmaceutical Preparations of Diethylstilbestrol, Ibid. 37:147 (April) 1948.

25. Keenan, G. L.: Microscopic Identification of Some of the Crystalline Sulfonamides, Ibid. 37:202 (May) 1948.

26. Keenan, G. L.: Note on the Microcrystallographic Properties of Rutin, Quercitrin, and Quercetin, Ibid. 37:479 (Nov.) 1948.

27. Keenan, G. L.: Microscopic Identity Tests for Hydrastis and its Principal Alkaloids, Hydrastine and Berberine, Ibid. 37:41 (Jan.) 1948.

28. Castle, R. N.: Optical Crystallographic Properties of Organic Compounds: I. Barbituric Acid Derivatives, Ibid. 38:47 (Jan.) 1949.

29. Bikin, H.; Jenkins, G. L., and DeKay, H. G.: Radio-Frequency Drying of Tablet Granulations, Ibid. 38:245 (May) 1949.

30. Patel, B. N.; Jenkins, G. L., and DeKay, H. G.: Infrared Drying of Tablet Granulations - I, Ibid. 38:247 (May) 1949.

31. Patel, B. N.; Jenkins, G. L., and DeKay, H. G.: Infrared Drying of Tablet Granulations - II, Ibid. 38:250 (May) 1949.

32. Koren, J. A. and Benton, B. E.: Improved Methods of Tablet Coating, Ibid. 38:267 (May) 1949.

33. Kelley, W. C.: The Use of a Microcrystalline Wax in Tablet Polishing - I, Ibid. 37:253 (June) 1948.

34. Kelley, W. C.: The Use of a Microcrystalline Wax in Tablet Polishing - II, Ibid. 37:332 (August) 1948.

35. Sperandio, G. J.; Evanson, R. V., and DeKay, H. G.: The Disintegration of Compressed Tablets, Ibid. 37:71 (Feb.) 1948.

36. Bauer, C. W. and Masucci, P. E.: The Action of Intestinal Enzymes upon Cellulose Acetate Phthalate and Butyl Stearate Enteric-Coated Tablets, Ibid. 37:124 (March) 1948.

37. Brewer, J. H.: Aseptic Operation and Control of Ampul Filling Rooms, Ibid. 37:415 (Oct.) 1948.

38. Yoder, L.; Royer, E. A., and DeKay, H. G.: Ampuls, Bull.Am.Soc. Hosp.Pharm. 5:14 (Jan-Feb.) 1948.

39. Sister M. Clara Frances: Parenteral Fluids Prepared in the Hospital Pharmacy, Ibid. 5:114 (May-June) 1948.

40. Sister Henrietta: Narcotics in Sterile Solutions, Ibid. 5:124 (May-June) 1948.

41. Patton, A. R. and Hill, E. G.: Inactivation of Nutrients by Heating with Glucose, Science 107:68 (Jan. 16) 1948.

42. Train, D.: Iso-osmotic Solutions, Pharm.J. 105:447 (Dec. 20) 1947 (4th series).

43. Skolaut, M. W.: Ophthalmic Medications, Bull.Am.Soc.Hosp.Pharm. 5:172 (July-Aug.) 1948.

44. Husa, W. J. and Dale, J. K.: Adjusted Collyria, J.Am.Pharm.Assoc. Pract. Ed. 9:421 (July) 1948.

45. Hartman, M. and Zopf, L. C.: Notes on Levigating Agents and Incorporation Procedures for Compounding Ointments, Ibid. 10:214 (April) 1949.

46. Nadkarni, M. V. and Zopf, L. C.: An Improved Calamine Lotion, Ibid. 9:212 (April) 1948.

47. Lehning, F. E.; Benton, B. E., and Series, E. R.: Electrode Jellies, Ibid. 9:410 (July) 1948.

48. Sperandio, G. J. and Lee, C. O.: Aromatic Elixir, Ibid. 9:24 (Jan.) 1948.

49. Francke, D. E.: Therapeutics Committee and the Hospital Formulary, Bull.Am.Soc.Hosp.Pharm. 5:6 (Jan.-Feb.) 1948.

50. Coffield, M.: Increasing Net Profit in Your Pharmacy, Ibid. 5:105 (May-June) 1948.

51. Cathcart, J. R.: Economics of Manufacturing in a 100-Bed Institution, Ibid. 5:168 (July-Aug.) 1948.

TIBIONE

TB-1

NEW DRUG EFFECTIVE AGAINST CERTAIN TYPES OF TUBERCULOSIS RECENTLY MADE AVAILABLE FOR EXPERIMENTAL STUDIES. KNOWN AS TIBIONE OR TB-1, THIS NEW DRUG OFFERS SEVERAL ADVANTAGES OVER OTHER THERAPEUTIC MEASURES.

Announcement of a new anti-tubercular drug with certain advantages over preparations now used offers new hope in the treatment of certain types of tuberculosis. According to the early reports, Tibione is comparable in its anti-tuberculous effect with para-aminosalicylic acid (PAS), which to date has shown promise in the treatment of TB along with streptomycin and dihydrostreptomycin. Known as TB-1 and Tibione,* this new compound was developed in Germany where it has been used with favorable results. In Germany, TB-1 is available under the name "Conteben".

First reports on this new compound in this country were presented at the Eighth Streptomycin Conference in Atlanta, Georgia on November 12. The conference is sponsored by the Veterans Administration and combined tuberculosis-study units of the Army, Navy and Air Force. Reports based on a study recently made in Germany sponsored by Schenley Laboratories, Inc., were presented by Dr. H. Corwin Hinshaw, noted San Francisco tuberculosis specialist and Dr. Walsh McDermott of the New York Hospital, Cornell Medical Center.

Advantages of Tibione therapy in tuberculosis over previous drugs as presented by Drs. Hinshaw and McDermott include the following:

1. It may be used in more cases than streptomycin;
2. It may be used over a longer period of time than streptomycin;
3. It may prove to delay development of streptomycin-resistant bacilli, when administered with streptomycin.

The fact that administration of Tibione and probably its beneficial action, can be continued for extensive periods without the same degree of toxic reaction that characterizes prolonged treatment with streptomycin, increases its potential value when used either alone or in conjunction with other proven methods of treatment in chronic types of tuberculosis. Tibione does not appear to have the dramatic and rapid effect of streptomycin. An additional advantage over other drugs now used to treat tuberculosis is the fact that Tibione is effective when administered orally.

HISTORY

Tibione was developed by Bayer research experts in Germany in cooperation with Professor Gerhard Domagk, who is a winner of the Nobel Prize for his development of sulfa drugs. It has been used on more than 10,000 tuberculosis patients with proven effectiveness against various forms of the disease. When Drs. Hinshaw and McDermott went to Germany as special consultants for Schenley Laboratories, Inc., they studied reports of the effect of Tibione on 2,000 patients who had been treated with Tibione in 10 hospitals, "usually for prolonged periods of time". Their survey indicated that Tibione is an effective weapon against certain forms of tuberculosis, particularly in such serious complications of the pulmonary type as tuberculous laryngitis and tuberculous enteritis.

In the case of laryngeal infection, the clinical studies abroad showed results "variously estimated from 90 to 100 per cent good to excellent," according to Dr. Hinshaw. Scientists in Western Germany were found to agree that 100 per cent of all patients with symptoms of intestinal tuberculosis benefited from treatment with Tibione. Indications were also reported that the drug may be effective against tuberculous empyema, a condition on which streptomycin has shown little effect.

It was further reported that some 300 hospitals and sanitaria in the Western Zone of Germany are participating in clinical trials and more than 7000 patients have been treated with Tibione during the

* Tibione is the trade name of Schenley Laboratories, Inc.

last two years. Preliminary work using Tibione and related drugs in the United States has been carried out by Dr. Geoffrey Rake, director of the Squibb Institute. He has reported that results of experiments with mice suggest that the compound held "high promise" of being effective in man. He further stated that the drug is active in very low doses and its toxicity in laboratory test has not been great. A report on the action of thiosemicarbazones in experimental tuberculosis in the mouse by R. Donovick and J. Bernstein, Squibb scientists, appears in the American Review of Tuberculosis (October, 1949).

CHEMISTRY AND PROPERTIES

Tibione belongs to a new group of chemicals--the thiosemicarbazones. It is known chemically as 4-acetylaminobenzaldehyde-thiosemicarbazone, and is unrelated to streptomycin and only distantly related to PAS and the sulfones.

Tibione is a pale-yellow, microcrystalline powder with a bitter taste. The compound is almost insoluble in water and only slightly soluble in organic solvents. However, solutions in propylene glycol, formamide, methylacetimide, and in aqueous antipyrine may be prepared. Preliminary clinical investigations have shown that its solubility in serum is superior to that in water alone.

CLINICAL USE

Tibione may be used either alone or in combination with other chemotherapeutic agents such as streptomycin, dihydrostreptomycin or para-aminosalicylic acid in the treatment of tuberculosis. Clinical trials reported in Germany indicate that favorable results have been obtained when using Tibione to treat laryngeal and intestinal tuberculosis as well as in the treatment of lupus vulgaris. It was also found effective against pulmonary and genito-urinary forms of the disease and in tuberculous empyema. Results in bone and joint tuberculosis have been encouraging; as with other anti-tuberculosis chemicals, poorest results were shown in miliary and meningeal TB.

ADMINISTRATION AND DOSAGE

Tibione may be administered intravenously or orally. It is now supplied in tablets of 25 mg. and 50 mg. On oral administration, Tibione is rapidly absorbed from the gastrointestinal tract. Elimination of the drug proceeds more slowly with 10-15 per cent being excreted in the urine.

Dosages of Tibione employed in the clinical trials abroad have varied from 12.5 to 300 mg. per day. The following dosage schedule is now recommended.

ADULTS

1st week, 50 mg. orally, per day, in divided doses
2nd week, 100 mg. orally, per day, in divided doses
Then, 200 mg. orally, per day, in divided doses

CHILDREN

1st week, 0.5 mg./kg. of body weight, daily
2nd week, 1.0 mg./kg. of body weight, daily
Then, 2.0 mg./kg. of body weight, daily

Duration of treatment: 6 months or longer; some patients have been treated for more than a year.

TOXICITY

Principal toxic symptoms observed following use of Tibione are anorexia, malaise, and (rarely) vomiting, all of which usually subsided with reduction of dose or temporary interruption of treatment. Mild anemia, occasional skin rashes, conjunctivitis, and mild albuminuria have also been encountered.

There is some evidence suggesting the possibility of an induced hepatitis which appears to be a reversible reaction. However, this question is not yet settled and must, for the present, remain an open one.

In a survey of 2,000 patients who received the drug, 8 cases of agranulocytosis were reported, one of whom died of this complication. However, in this case and at least several of the others, the patients had been receiving pyramidon when the reaction appeared. It is recommended that patients undergoing Tibione therapy be given complete blood counts not less than once a week, and preferably twice a week.

AVAILABILITY

Supplies of the drug have been made available for experimental clinical studies by Schenley Laboratories, Inc. and will be released to certain government agencies and outstanding tuberculosis research organizations. It may be purchased on completing the FDA application for drugs for investigational use.

E. R. Squibb and Sons have also announced that they will make TB-1 and other related drugs, possibly of greater value, available in the near future. They also report that they have been working on a number of anti-tubercular agents with chemical structure related to this thiosemicarbazone.

As soon as further clinical trials have been carried out and the results thus far obtained confirmed, Tibione will be generally available for use in the treatment of certain types of tuberculosis.

Manufacturing CONTROL SYSTEMS in Hospital Pharmacy

By Dr. Carl J. Klemme, Professor of Industrial Pharmacy
St. Louis College of Pharmacy and Allied Sciences, St. Louis, Mo.

Presented at the Institute for Hospital Pharmacists
The Catholic Hospital Association
St. Louis University, June 8 - 12, 1949, St. Louis, Mo.

The word "control" has a very broad meaning. As a verb, it means "to exercise a directing, restraining, or governing influence over," and thus it may be applied to all phases of directing, restraining, or governing the operations of any enterprise regardless of what it may be. Specifically, we are concerned about the application of control to the manufacturing operations in a hospital pharmacy. Customarily, we think of "control" in pharmaceutical manufacturing as the process of governing the quality, purity, and strength of the preparations made; but there is likewise a function of "control" in governing the manufacturing operations for economic reasons. We may think of the first type as "quality control" and of the second as "budgetary control." Let us discuss briefly the fundamentals of budgetary control first.

BUDGETARY CONTROL

Budgetary control involves primarily the planning of operations for the budget period, and secondarily, the scheduling of work so as to have all necessary items in stock without having excessive inventories. In accomplishing such control, one finds many advantages. The individual in charge of the manufacturing operations is able to tell the hospital Purchasing Agent well ahead of time just what items and the quantities that will be needed for any given period whether the period be a month, a quarter, or a year. Usually, the budget period is one year, but this is broken into quarters for the purposes of purchasing; then further broken down to months or even weeks for the scheduling of operations. Thus, the Purchasing Agent is able to take advantage of the best quotations, quantity purchases, and never has to pay a premium for rush delivery, especially of small quantities. A second advantage lies in the fact that both raw materials and finished goods are always on hand in the quantities necessary to supply the demand, but not in such quantity as to have an undue amount of money invested, or to cause losses by deterioration and obsolescence. A third advantage is the smoothing of operations so that there is no feast or famine. This is particularly important in keeping everyone in the pharmacy gainfully employed at all times and not putting them under pressure to rush the manufacture of some items. Such pressure is very apt to be the cause of errors. The ultimate advantage of successful budgetary control is a minimum cost of production.

The question arises, of course, as to how budgetary control is effected. There is no doubt about it, it takes plenty of work, care, and thought, as well as cooperation from the hospital authorities, to install a system of budgetary control. But once it has been properly installed and is running smoothly, it requires little effort to maintain it and all its advantages will be fully apparent.

MANUFACTURING REQUIREMENTS

The first step in establishing the control is to determine from past records, and with the aid of

the hospital superintendent, what the manufacturing requirements for the coming year will be. This forecast is comparable to the sales budget or sales forecast in the industrial field, but in your case, of course, it amounts to the annual hospital requirements. Your first efforts on such a forecast will seem very shaky and uncertain, but do not be discouraged. Your first forecast may be considerably off due chiefly to lack of experience in this field and to the constantly changing requirements. This should not alarm you or make you feel that the effort is not worthwhile because you have every opportunity during the budget year to make changes in the forecast, to step up production or to curtail it on certain items as demand requires.

For the beginner, it is suggested that you make your initial forecasts on only half a dozen commonly used items, and make this forecast for one year in advance. Then, at the end of three months, make another forecast for one year in advance, taking into account your experience of the past three months to see how well your original forecast worked during that period. In making the second forecast, add two or three or another half dozen items. Thus, with each quarterly forecast, you will add more items to your requirement budget until ultimately you have quite a complete list. Do not try to forecast the requirements of everything. It simply cannot be done. Such an attempt creates excessive work and only serves to discourage even the most ambitious and conscientious worker. There will always be requirements for new products, the use of some items will diminish, and the need for small volume items may fluctuate violently. None of these conditions should disturb your peace of mind. All the advantages of budgetary control lie in governing the manufacture of your steady, large or medium volume products. In the industry, the budget is set up for practically every item in the line, but the emphasis is placed on what we call the "main line" or "bread-and-butter" items, viz. those which have reasonably good volume. If you can cope with these successfully, you are doing a magnificent job. You can then handle the "cats and dogs" with ease as they arise.

You will note in making up your requirements budget that some items are in steady demand while others are seasonal. These trends must be taken into account when scheduling your production.

MATERIAL REQUIREMENTS

Having determined your requirements, the next steps follow in logical sequence. You determine your materials requirements, i.e., drugs, chemicals, packaging materials, labels, small or expendible equipment items such as filter paper, cotton, glass tubing, etc. This is done by taking the quantities of raw materials from the working formula and packaging specifications of each item required and multiplying these quantities by the number of times the formula must be made up to satisfy the year's requirements. The quantities of raw materials required for each item are entered on a summation, or accumulation sheet because the same drug or chemical may be required in half a dozen different formulas. For example, petrolatum may be necessary for the manufacture of four or five different ointments, and the quantity for each ointment should be tabulated on the summation sheet. After all the formulas the packaging specifications for each item on the requirements budget have been broken down, the raw materials requirements are totaled and then broken down into quarterly requirements, taking into consideration the seasonal items, and requisitions placed for the first quarter's needs. Thus, by far the great majority of your ordering is done four times a year, and in this method you have a close control over your stock inventory. If properly done, you will not have excessive stock, but each item will be there when you need it.

MANUFACTURING CAPACITY

Next it is necessary to know your manufacturing capacity. First, do you have the kind of equipment necessary to make the required items? Second, does the equipment have the capacity to turn out the necessary quantity of the required items? The chances are pretty good, in most hospital manufacturing laboratories, that your machine capacities will be ample. It has been my experience in visiting such laboratories, that much of the equipment is idle most of the time. This is one reason, although not necessarily the main reason, why hospital manufacturing often fails to be profitable. Every effort should be made to make full use of your machine capacity.

AVAILABLE PERSONNEL

Closely linked to machine capacity is your available man-power. In hospital manufacturing, this is generally the crux of your planning and scheduling. You will know pretty well from past experience two important things about each formula, viz., the number of hours of labor required to make up the formula, and the elapsed time from the start of manufacture to the completion of the finished product. Obviously, both the working time and the elapsed time are of fundamental importance in scheduling the work. Do you have sufficient manpower to make up all the required items for the budget period? Do not have or ask for more man-

power than you actually need because unproductive labor is most unprofitable and will put red ink on your ledger sheet faster than anything else. It is poor management to have a payroll which does not pay its own way.

OPERATING COSTS

Having determined the materials and labor requirements, you are in a position to forecast your costs of operation for the budget period and thus set up a satisfactory production budget in terms of dollars and cents. If you do not already know what the overhead is on your manufacturing laboratory, ascertain from the hospital management what fixed charges are levied against the laboratory. With a little experience you will be able to establish a ratio between the direct labor cost on manufacturing and the overhead or fixed expenditures. If your laboratory is busy most of the time, this ratio will be comparatively low; but if manufacturing is done only occasionally or sporadically, the ratio may become so high as to price you out of business.

In costing your products, let us take an example. Assume that you have established the ratio of overhead to direct labor dollars as 300 per cent. Now let us say that the materials for a batch of the product costs A dollars, and the direct labor on the batch costs B dollars. Then the total cost of producing that batch will be $A plus $B plus $3B, the latter representing the overhead. To put it more concretely, let us say that for manufacturing 10 gallons of an elixir, we have the following costs:

Materials	$ 8.50
Direct Labor	7.85
Overhead @ 300%	23.55
Total Cost	$39.90

You are now in a position to cost your product on the basis of any unit you may wish, whether it be gallons, liters, pints, or fluid ounces.

It should be noted that the unit cost of the above mentioned elixir is $3.99 per gallon. Suppose we had made 20 gallons per batch? The material cost would be double, but the direct labor and overhead costs would not increase in direct proportion to the quantity made. It requires very little more time to make a 20-gallon batch than a 10-gallon batch. Where the direct labor cost will be in direct proportion to batch size is in the filtering and bottling, or packaging. For the 20-gallon batch the figures in this example would be roughly:

Materials	$17.00
Direct Labor	9.50
Overhead @ 300%	28.50
Total Cost	$55.00

This batch would be costed out at $2.75 per gallon, or $1.24 cheaper and a saving of 32%. This does not mean that we should go all out and make it up in 100-gallon batches, even if the equipment were available. In the first place, the cost curve does not decrease so sharply as we increase the batch size. In the second place, we should never make up more than the requirements call for, because it is false economy to keep idle dollars in your inventory. It therefore behooves the hospital manufacturing pharmacist to determine what is known in the industry as the economical batch size.

It may require three years or more to establish a smoothly operating budgetary control in your manufacturing laboratory. Once it has been done, you will find it well worth the effort. One of the main reasons that a fairly long period of establishment is required is the group of items which fluctuate in quantities or come and go. You will find it simple enough to establish your budgetary control for the more stable items in terms of units, pounds, gallons, or cost; but you must have a table of experience on which to base your estimated requirements and costs of the fluctuating items. It will generally be found that the quantities and costs of the fluctuating items will be a fairly constant percentage of the total production; let us say, for example, 30%. When you have determined your operating costs for the stable items which would, in this example, constitute 70% of the cost, you can then make allowance for the fluctuating items and complete your budget for the budget period. Then you will have a yardstick for your purchase of raw materials to the best possible advantage, the planning and scheduling of work in such a fashion as to maintain adequate but not excessive stocks and to obtain maximum service from employees, and finally to keep a rigid control over the costs of manufacture. The latter is accomplished by determining actual costs of production against the estimated budget costs. Do not be surprised by the fact that there will almost invariably be some discrepancy between these figures, but if the difference is more than plus or minus five per cent, the reasons should be investigated. During the first and second years of your venture in budgetary control, you may find many large discrepancies but beginning with the third year you will have a pretty tight control over your manufacturing costs.

QUALITY CONTROL

While the problem of quality control may seem remote from budgetary control, these two types

of control tie closely together. For example, as a part of the procedure in budgetary control, the items ordered for manufacturing should be given a receiving number which enables one to not only identify each lot of material at any time but it affords a method of enforcing the general rule of "first in, first out." Thus it becomes impossible for old stocks of raw materials to accumulate.

Before going further into the matter of quality control, it might be well to point out that this term is too often applied to and confused with the term "statistical quality control." The latter term is applied to statistical methods for the control of sizes, weights, fills, and other physical attributes of almost any type of article in production. It has a very definite place in commercial pharmaceutical production, but it is not of particular value in hospital manufacturing except for determining the size of sample for analytical procedure which will insure proper quality. Therefore, as we use the term "quality control," let us think of it as that phase of the work which, by suitable methods, determines the strength, purity, and identity of the preparations made. There is no one particular system of quality control, and there may be as many systems as there are manufacturing laboratories. In general, it is best to devise your own system which will best suit your own requirements. No matter what kind of a system you devise, it should have the following attributes: First, it should be effective in determining the quality of the product; second, it should give you a complete history of the product, i.e., the sources of the raw materials, who made the product, who checked the weights or measurements, what equipment was used, what - if any - special procedures or deviations for standard procedures were used, date of manufacture, etc.; third, the system must be as simple as possible.

Let us remember from the beginning that you cannot inspect quality into a product. A product will have the proper quality only as a result of the proper procedures used in manufacturing, and therefore all actions and methods employed in the manufacturing procedure will contribute to the quality of the product. The analytical or assay methods employed in testing intermediates or finished products are simply checks on the care with which the manufacturing process has been carried out. Hence, the control of quality starts with the job of ordering raw materials and ends when the product is placed in its final container.

In ordering raw materials, one must be sure to put down the correct specifications. Too often, one may order Citric Acid and receive the granular instead of the powder or crystalline when the anhydrous is wanted. Your working formulas, of course, are the key to all specifications for drugs and chemicals.

When raw materials are received, they should be given a receiving number. Some hospitals have a common receiving department through which all incoming materials pass, and at this point a receiving slip - serially numbered - is issued for the incoming shipment. If the hospital does not have such a system, the manufacturing laboratory should institute its own system because it is impossible to trace the complete history of a product without it. The receiving slip should bear (1) a serial number, (2) date of receipt, (3) name(s) and specifications of the item(s), (4) quantity of each item, (5) name of the vendor, and (6) number of the purchase order. The accounting office may need other information on the receiving slip and it would therefore be advisable to consult with the accountant before establishing the form of your receiving ticket. Most important, now, is the identification of each raw material container by writing the receiving number on it. If, as occasionally happens, you receive two or more different manufacturers' lots of the same item, it should be so noted on the receiving slip and the containers marked not only with the receiving number, but with an identifying letter.

The next step is not essential but is often used and constitutes a safeguard against using the wrong material in a formula. This is the use of an "Identification Number". Each raw material, whether it be drug, chemical, bottle, cap, collapsible tube, or ampul, is assigned an identification number. Such numbers may be assigned at random and not necessarily alphabetically because it is impossible to retain such order as time goes on. The extra work involved in this procedure requires the maintenance of a cross-file, one numeric and the other alphabetic. When a raw material is received, then, in addition to writing the receiving number on the container, the identification number is also placed on the container, preferably in large print. One of the most important things about identification numbers is to assign widely different numbers to very similar products. For example, you may have sodium carbonate anhydrous, sodium carbonate monohydrate, sodium sesquicarbonate, sodium carbonate decahydrate. Each of these should be given widely different numbers to avoid possible errors.

The goods having been received and identified, they are then recorded in the raw material inventory. Such an inventory is best maintained on fairly large file cards which have been set up in suitable form. Each item should have its own card, and each card should be headed with (1) name of the item, (2) specifications of the item, and (3) the identification number, if used. In the body of the card there should be columns for (1) date, (2) quantities received, (3) quantities dispensed, (4) balance on hand, (5) receiving number, (6) lot

or batch number of a formula for which a dispensal is made. Thus, this card constitutes a perpetual inventory and a running history of the receipts and dispensals of any given item.

WORKING FORMULA

The next step in controlling the quality as the product is made is the manufacturing order or working formula. This may be made up in a printed or mimeographed form with spaces for all pertinent data. There is no standard form, and generally they are made up to suit the requirements of the laboratory or plant. There should be spaces at the top to show (1) name of the product, (2) dosage (if a tablet, capsules, etc.), or the strength (if an ointment or liquid preparation), or simply U.S.P. or N.F., (3) the lot or batch number, (4) the quantity to be made, (5) the date of issue, (6) the scheduled date of completion. In the body of the order there should be columns for (1) names of the ingredients, (2) the receiving number of each ingredient to be used, (3) the identification number (if any) of each ingredient, (4) the quantity of each ingredient. Below this, there should be spaces for (1) special manufacturing instructions, (2) initials or signature of the operator, (3) initials of the person weighing or measuring ingredients, (4) initials of the person who checked the weights and measures, (5) dates and times of starting and completion (this gives the elapsed time), (6) hours of actual labor on the batch, (7) packaging instructions in detail, (8) comments on any unusual procedure or observation, (9) theoretical yield, (10) actual yield, (11) per cent yield. If it is general practice to make standard batch sizes, the formula - as well as all other fixed data for the product (name, strength, quantity, manufacturing instructions, packaging instructions, theoretical yield, etc.) - may be imprinted on the formula sheet by means of a "DITTO" machine. A "DITTO" sheet, properly preserved, will give up to 200 impressions. This not only saves much time, but it precludes the possibility of typographical errors for that part of the formula sheet having standard content. When the formula sheet or manufacturing order has been completely filled out, it should be proof-read by two people, one reading it aloud while the other checks the data as read.

Careful observance and performance in the manufacture of the product according to the formula sheet insures quality in the product. All that remains now to complete the thread of history of the product is to place the lot or batch number - sometimes called the control number - on the labels of the final containers.

Several refinements might be added to the foregoing as the operations may require or as may be desired. The purpose here is to give only the minimum essential requirements of quality control through the manufacturing procedure. Drug manufacturing houses often have very elaborate systems, but these are necessary or desirable only because of the extreme complexity of operations and the large number of products made.

ASSAY

The final phase of quality control is the assay of the product. As indicated earlier, this can be only a check on quality. It cannot make or break the product because the product is either good or bad before the assay stage is ever reached. Hence, the great importance in quality control lies not in the assay, but in proper control from the very beginning.

Laboratory control, or assay, involves three steps (1) sampling, (2) the physical and chemical assay procedures, and (3) decision to accept or reject.

First one obtains what is usually called a representative sample. Better terminology, especially from the viewpoint of statistical quality control, is a random sample. Assay results, particularly on unit products such as tablets, capsules, etc., or on a collective sample from several containers, may be completely invalidated unless the sample is randomized. The subject of sampling is one in itself and any worthwhile discussion of it would require fully as much time as, if not more than, this entire paper.

Little need be said about the physical and chemical assays. Each product has its own identification and purity tests. Each product has its own quantitative assay procedures, and the technics of drug assay methods are available to everyone in the standard works and references. It seems that the most noteworthy point in connection with laboratory control is bound up in the fact that many assays are time-consuming and expensive, and that hospital control laboratories cannot afford certain very expensive instruments required for the performance of certain assays. Thus, it may not be feasible to assay certain products and this emphasizes even more the necessity of proper quality control from the beginning. Build in the quality and you have it.

Lastly, when a product has been assayed, the decision to accept or reject is usually simple. Occasionally there are border-line cases which require good judgement on the part of the person responsible. Often, in such cases, there are good possibilities of salvaging sub-standard products by proper action, and the control chemist, as well as the manufacturing operator, should use every ingenuity to salvage rather than discard.

CHARGES FOR DRUGS

At the recent Institute on Hospital Pharmacy held in Chicago, one of the subjects discussed in the Workshop on Hospital Pharmacy Administration and Policy was charges for Drugs. Hospital pharmacists will be interested to note the following conclusions reached by this discussion group on charges for drugs:

1. It was agreed that the pharmacy should be a source of income because more than fifty per cent of patients in hospitals receive service from this department.

2. Because of the total pharmacy operating expenses such as salaries, maintenance and indirect expenses such as heat, light, power, and repairs, adequate charges must be made on drugs dispensed to patients.

3. The large inventory on hand required to give hospital patients immediate service must be offset by adequate charges on drugs.

4. Most hospital patients preferred to be charged individually for drugs used during their care than to be on flat rate of drug charges as has been the custom in some hospitals.

5. Charges for drugs in a hospital should not exceed a charge made in commercial drug stores for equivalent service or material.

6. A fair income may be realized by making a drug charge of 100 per cent above cost for antibiotics (high dollar volume cost drugs) and a fifty per cent mark up above cost on all remaining drugs.

7. Hospital business accountants advise that as a general rate a markup of 66 per cent above cost should be charged on all items to meet all pharmacy expenses and to realize a fair income from the department.

8. It was generally agreed that the majority of hospitals' drug charges ranged between 66 and 100 per cent markup above cost of drugs.

9. Doctors, nurses, and other hospital personnel usually receive drugs at 20 per cent above cost charge.

AHA PLANS 21 INSTITUTES FOR PRESENTATION IN 1950

The American Hospital Association's Council on Education has announced plans for 21 Institutes in 1950. The course will cover 12 subject areas and will be held in 15 different cities.

Next year, for the first time, the Association will conduct a series of nine two-day Institutes in conjunction with meetings of state and regional hospital associations.

Three of the two-day Institutes will be on Accounting, two on Public Relations, two on Purchasing and one each on Personnel and Dietetics.

Subject areas of the 12 five-day Institutes are Hospital Establishment, Engineering, Nurse Anesthetist, Accounting, Pharmacy, Laundry, Personnel, Purchasing, Medical Records, Housekeeping, Dietetics and Planning.

First Institute on the 1950 schedule is Hospital Establishment--a course especially for groups getting ready to establish a new hospital or interested in reorganizing one already in operation.

The Establishment Institute will be held at Chicago's Edgewater Beach Hotel from January 16 to 20.

ADVANCE SALF OF CUMULATIVE INDEX OF HOSPITAL LITERATURE OPENS

Orders are now being taken for the American Hospital Association's five-year Cumulative Index of Hospital Literature--the first index of its kind ever published in the hospital field.

In the past five years, the Association's Library has cataloged all articles on hospital subjects appearing in 85 periodicals. The Cumulative Index will contain information on how to find those articles.

The 20,000 listings in the publication will be cross-indexed by subject and author to make it doubly useful.

Articles appearing in the 85 selected periodicals between January 1, 1945 and December 31, 1949 will be listed in the Cumulative Index. It will go to the printers early in 1950 and be ready for distribution to subscribers in the spring.

Advanced orders for the Cumulative Index may be sent to the Circulation Department of the American Hospital Association, 18 East Division, Chicago 10, Illinois. Price is $5.

Glycerin Substitution in Phenobarbital Elixir U.S.P. XIII*

S. J. Dean and D. C. Brodie**

During the recent war emergency and in the period immediately following, the manufacture of many pharmaceuticals was complicated by the shortage of certain essential materials, particularly glycerin, sucrose, and alcohol. The preparation of elixirs was thereby especially troublesome since the above mentioned substances are essential components in elixir formulation.

The manufacture of a stable Phenobarbital Elixir, U.S.P., was a particular problem at the University of California College of Pharmacy Manufacturing Unit. In an attempt to provide an acceptable preparation during the national emergency, the U.S.P. XII, through the medium of the First Supplement[1], authorized the following modification of the official Phenobarbital Elixir: glycerin, decreased from 45 per cent to 10 per cent by volume; alcohol, increased from 12.5 per cent to 17.5 per cent by volume; and sucrose, increased from 15 per cent to 40 per cent as syrup. Although the general acceptance of the Elixir was satisfactory, the stability at low temperatures would not permit storage under such conditions without precipitation of phenobarbital. The Committee on National Formulary[2] modified many formulas through the substitution of propylene glycol for glycerin. Before deletion of Elixir of Phenobarbital from the N.F. VI, Dean and Levy[3] observed that by replacing both glycerol and sucrose with glucose, an elixir with excellent keeping qualities could be prepared. In fact samples prepared in 1942 have withstood storage at room temperature without detectable changes in color or odor since that time.

Because of the above-mentioned problem in stability with the U.S.P. Elixir, it became necessary to study further the problem of glycerin substitution. Since 1942, twenty three individual formulas for Phenobarbital Elixir have been investigated at the University of California, and from this group a number of satisfactory alternate formulas have been developed. The purpose of this paper is to make available in the pharmaceutical literature, those combinations of ingredients which permit partial or total glycerin substitution in the official Phenobarbital Elixir. Glycerin will undoubtedly remain an essential war material, but whether critical shortage will occur in the event of future emergencies, depends in part on how successful the new commercial production[4,5] of glycerin by the chlorination of propene meets the military and commercial requirements.

EXPERIMENTAL: Propylene glycol, sorbitol (Arlex, Atlas), mannitol, glucose, and dextrose were selected as potential agents for maintaining sweetness, viscosity, and stability in preparations with modified glycerin contents. These were chosen because of their availability during the crisis, because of their desirable physical and chemical properties, and because each possesses a suitable margin of safety[6,7,8,9,10,11,12]. The following alterations in the official formulas were studied: (1) propylene glycol as a substitute for glycerin, in toto; (2) propylene glycol in combination with (a) syrup, (b) syrup and dextrose, (c) syrup and sorbitol, (d) syrup and mannitol, as substitutes for glycerin; (3) propylene glycol as a partial substitute for glycerin, in combination with syrup. In all cases the official alcohol content remained constant (12.5 per cent by volume) and the phenobarbital concentration was maintained within official limits. Samples were prepared in 100 cc. amounts.

The standards for comparison were preparations made according to U.S.P. XII or XIII specifications, the criteria in each case being: color, taste, odor, viscosity determined with the Oswald Viscosimeter, specific gravity determined by the pycnometer method, and stability, based on storage at room temperature for one year, 40° C. for 21 days, and 5° C. for 21 days. Those samples stored at 40° and 5° were subsequently stored at room temperature for the remainder of one year. In all cases in which precipitation occurred, the precipitate was recovered, recrystallized and identified as phenobarbital by the melting point.

RESULTS: Table I presents those formulas that were observed to be acceptable according to the described criteria. Propylene glycol, when used as a substitute for glycerin in equal parts by volume, was judged the most satisfactory replacement. By replacing the glycerin with propylene glycol, it was possible to omit the syrup from the formulas without serious impairment of taste, color, or stability; the specific gravity of this combination was somewhat lower than that of the official preparation. The other sugars were suitable

* A contribution from the Manufacturing Unit of the University of California College of Pharmacy, The Medical Center, San Francisco 22, California.

** Presented before the Practical Pharmacy Section of the American Pharmaceutical Association at Jacksonville, Florida.

glycerin replacements for sweetness and body, but the presence of either propylene glycol or glycerol was necessary to stabilize the preparations and to prevent precipitation of phenobarbital.

CONCLUSION: The formulas for fifteen alternate Phenobarbital Elixirs in which glycerin has been substituted in part or completely by combinations of propylene glycol, sorbitol, mannitol, dextrose and syrup have been presented. Each formula has been compared with the official preparation regarding color, taste, odor, viscosity, specific gravity, and stability, and judged to be generally acceptable.

The authors wish to acknowledge the assistance of Mr. C. A. Look and Mr. Earl H. Eggett for preparing many of the samples reported in this paper.

TABLE I

PHENOBARBITAL ELIXIR, USP XIII, WITH MODIFIED GLYCERIN CONTENT

Formula Number	Alcohol	Glycerin	Syrup	Propylene Glycol	Dextrose	Sorbitol	Mannitol	Sucrose	40° C.	Room Temp.	5° C.
USP XII & XIII	12.5%	45.0%	15.0%						clear	clear	clear
USP XII (Supplement)	17.5%	10.0%						40.0%	clear	ppt.	ppt.
1	12.5%			45.0%					clear	clear	clear
2	12.5%		15.0%	45.0%					clear	clear	clear
3	12.5%		25.0%	45.0%					clear	clear	clear
4	12.5%		45.0%	37.0%					clear	clear	clear
5	12.5%		17.5%	17.5%	25				clear	clear	ppt.
6	12.5%		22.5%	22.5%	15				clear	clear	clear
7	12.5%		13.5%	13.5%		33			clear	clear	clear
8	12.5%		17.5%	17.5%		25			clear	clear	clear
9	12.5%		22.5%	22.5%		15			clear	clear	clear
10	12.5%	22.5%	15.0%	22.5%					clear	clear	clear
11	12.5%	15.0%	15.0%	30.0%					clear	clear	clear
12	12.5%	7.5%	15.0%	37.5%					clear	clear	clear
13	12.5%	2.5%	15.0%	42.5%					clear	clear	clear
14	12.5%		17.5%	17.5%			6		clear	clear	clear
15	12.5%		22.5%	22.5%			5		clear	clear	clear

(Brodie and Dean, 1949)

REFERENCES

1. Pharmacopoeia of the United States, (Ed. XII), First Bound Supplement, page 29, Mack Printing Co., Easton, Pa., 1944.

2. J. Am. Pharm. Assoc., Pract. Pharm. Ed., 4:384, 1943.

3. Dean, S. J. and Levy, S. W.: (Unpublished Data).

4. Levey, H. A.: Ind. Eng. Chem., News Ed., 16:326, 1938.

5. Williams, E. C.: Ibid., 16:630, 1938.

6. Seidenfeld, M. A. and Hanzlik, P. J.: J. Pharmacol., 44:109, 1932.

7. Smyth, H. F., Jr., Seaton, J. and Fischer, L.: J. Ind. Hyg. and Tox., 23:259, 1941.

8. Newman, H. W., Van Winkle, W., Jr., Kennedy, N. K., and Morton, M. C.: J. Pharmacol., 68:194, 1940.

9. Morris, H. J., Nelson, A. A., and Calvery, H. O.: J. Pharmacol., 74:266, 1942.

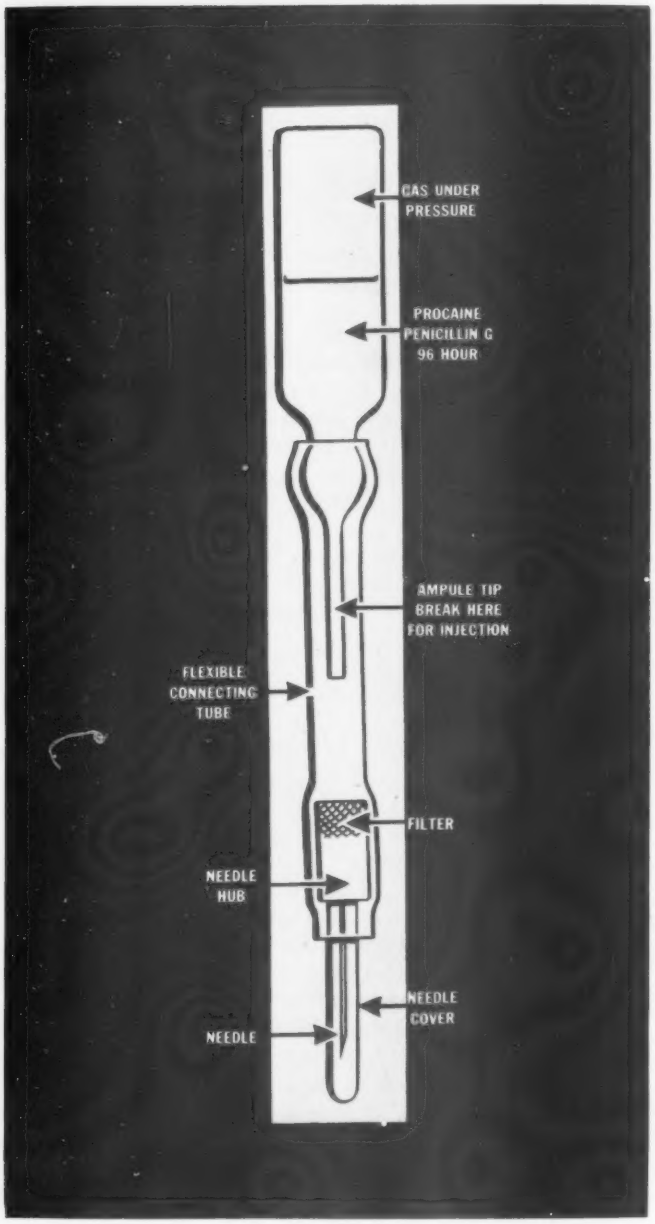
10. Robertson, O. H., et al: J. Pharmacol., 91:52, 1947.

11. West, E. S. and Burget, G. E.: Proc. Soc. Exp. Biol. Med., 35:105, 1936.

12. Dominguez, R., Corcoran, A. C., and Page, I. H.: J. Lab. Clin. Med., 32:1192, 1947.

A NEW DISPOSABLE AUTOMATIC INJECTION DEVICE

W. W. Hosler and Walter F. Wargell**



* From the Research Laboratories of Strong Cobb & Co., Inc., Cleveland 4, Ohio.

** Presented at A.S.H.P. Annual Meeting, Jacksonville, April, 1949.

The hypodermic syringe and needle has served mankind and mankind's helpers, medicine, pharmacy and nursing extremely well since the original introduction of this means of administering medication back in the 1850's.

The subject of this paper is the first practical means of making an automatic hypodermic injection. It actually makes an injection that has less opportunity for contamination and less chances for making errors than an injection made under the finest aseptic conditions that are available in our modern hospitals.

This device, called an Ampin, a contraction of the words "Automatic Ampul Injection," fulfills all of the exacting requirements for administering parenteral drugs and yet is so simple in construction and so easy to operate that an injection can be made in a matter of seconds after the need arises.

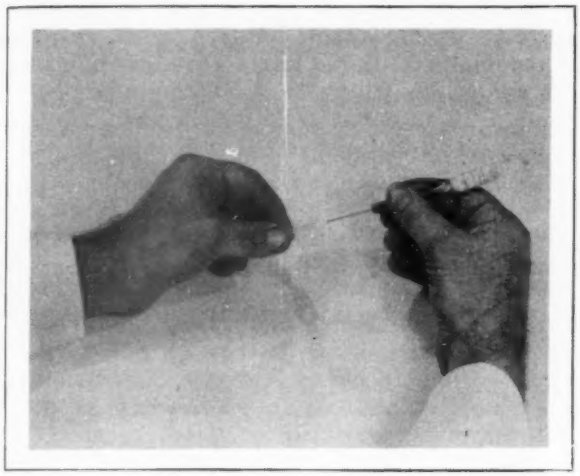
This device consists of a special drawn ampul which contains the liquid medication sealed in the ampul under pressure of an inert gas, a flexible connector tube that connects the ampul with the stainless steel needle, a filter and a needle cover. The whole device is sterilized as a unit after assembly of the parts or is sterilized as separate parts and aseptically assembled as is the case with Ampins of Penicillin.

TECHNIC OF AMPIN INJECTION

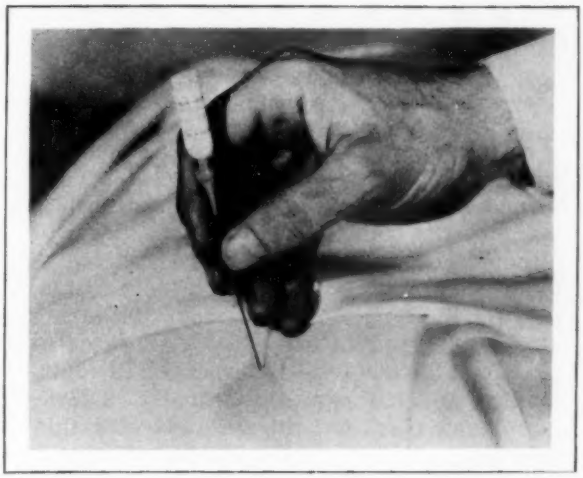
To operate this device, the site for injection is cleansed, the needle cover is removed by twisting and pulling, holding the device in a "Bottoms Up" position, as one would hold a pencil, with the hub of the special needle grasped between the forefingers, the needle is inserted, and the tip of the ampul is snapped off simply by bending the flexible tube with the fingers, as one would break a matchstick with the fingers. The gas pressure in the ampul injects the medication without any effort on the part of the operator. The basic principle upon which the Ampin operates is the substitution of inert gas under pressure for the piston of the syringe. The manner of holding and inserting the Ampin differs from that generally employed in using a regular syringe and needle. With this new device, the bottom of the Ampin must always be up. If this is not done, then the medication will be below the gas and when the ampul tip is snapped, the gas will emerge and the medication will stay behind.

This principle was first used during the war in Spain. The Spanish physicians realized that their efforts to save lives would be greatly increased if whole blood could be administered as soon as the

HOW TO USE . . .

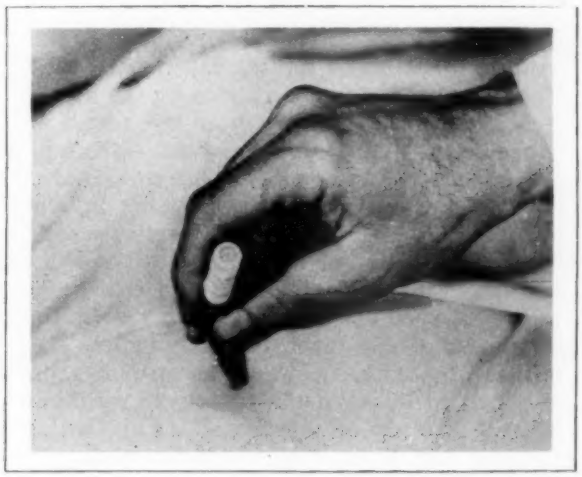


1. Remove needle cover by twisting and pulling.



2. Keep "Bottoms Up." Insert into tissue.

3. Flatten Tube to Aspirate.



4. Make injection by breaking ampul tip.

casualty occurred. They conceived the idea of a pressurized container. A special drawn ampul containing 300 cc.'s of whole blood was sealed under pressure of filtered, sterilized air and the ampul was aseptically connected to the intravenous needle with a venoclysis tube, both having been previously sterilized. This method made it possible to give blood transfusions at front line installations, and even on the battlefield itself, without danger of mishap. Thousands of lives were saved through the use of this new system.

Starting with this basic principle, it immediately became apparent that much work would have to be done before such a device could be presented as an everyday working tool to the health professions.

Because plastic tubing has largely replaced rubber for venoclysis use, we first directed our attention to this field. We investigated two basic types of tubing with eleven special formulations in one type and three special formulations in the other. We learned that plastic tubing has a very marked tendency to split during sterilization of the Ampin at the stressed points, which are the bulb of the ampul and the hub of the needle. It also tends to assume the shape of the stressing means with consequent loss of elasticity at these points. The transparency of plastic was a very desirable feature from the standpoint of visualization of blood upon aspirating after the needle has been inserted.

ASPIRATION WITH AMPIN

Incidentally, to aspirate with the device, you merely flatten the connecting tube just behind the hub of the needle with the thumb and forefinger as though you were squeezing the top of a dropper.

Releasing the finger pressure will create a vacuum and if the needle is in a vein, blood will show in the connecting tube just above the needle hub.

TUBING USED

As it became apparent that our efforts to eliminate these shortcomings were of no avail, we turned to rubber tubing. Pure Latex rubber tubing met the "elasticity after sterilization" test, although the clarity was far from our requirements. Through cooperative efforts on the part of the B. F. Goodrich Company, we were able to secure a latex tube of a clarity superior to that of plastic. This material is now used in regular production and has proved clinically satisfactory.[5] Accelerated aging tests indicate that this tubing functions after two years normal storage.

PURPOSE OF FILTER

Simultaneously with the work on the tubing, investigational work in the filter was conducted. The filter serves two purposes on the device. The first is to prevent the tip of the ampul which is broken off in activating the device from plugging the canula of the needle, which would, of course, prevent the medication from being injected and, secondly, to retain the glass particles formed by breaking the ampul tip. Many different types of material were tested. The one finally selected was a lint-free balloon cloth with a definite thread count and with a low absorption value. This particular material allows the passage of but 13 gammas of glass per unit, or 13 millionths of a gram. A study on injected glass by Drs. John H. Brewer and J. H. Fitzgerald Dunning, reported in the J. Am. Pharm. Assoc. Sci. Ed.[1] showed that animals withstand a substantial quantity of injected glass. "Based on body weight, this would be about 14 grams in man in one month, or about 0.5 gram per day." This is about 40,000 times the amount that is injected by one Ampin.

This filter was found to be satisfactory for all types of clear solutions whether aqueous or oil. It is not satisfactory for use with suspended materials, such as crystalline procaine penicillin G, 300,000 units, suspended in oil with 2 per cent aluminum monostearate. A wire screen filter of resistant alloy was developed for this type of material. This filter permits the passage of the micronized particles of crystalline procaine penicillin G with delivery of the full dose stated on the label.

The distribution of the medication in the tissues and the rate of absorption appears to be extremely uniform as well. A recent penicillin blood level study on a lot of crystalline procaine penicillin G, 300,000 units per cc., in peanut oil suspended with aluminum monostearate 2 per cent, in which the bulk material was tested both by the usual syringe and needle technic and in Ampins, revealed that the material in the latter gave, out of a total of 15 cases, blood levels of 0.06 units per cc. of serum in all 15 cases at 72 hours, and 0.06 units in 5 cases and 0.03 units in the remaining 10 cases at 96 hours.[2]

The same material injected via syringe and needle showed great variation at both the 72 hour and 96 hour periods from this pattern. This comparison indicates that the method of injection rather than the material used introduced the variations observed.[2]

ACCURACY

It was very quickly observed that the accuracy of the dose injected by the device was a function not only of the uniformity with which the ampul was filled, but also a function of physical uniformity of the ampul itself as well as of the inside surface of the connecting tube which was exposed to the wetting action of the solution contained in the device. Through a series of close controls and physical inspections, we have succeeded in producing an Ampin that is now accurate to a plus or minus 5 per cent.

STABILITY OF SOLUTIONS

Our investigations have shown that there is no difference in the keeping qualities of medication in ordinary sealed ampuls which contain atmospheric air and in Ampins containing air under pressure. It was felt, however, that if some method of slowing down the decomposition rate of certain products, such as solution of morphine sulfate, could be found that it would be of real advantage. The chemically inert gases were then investigated and helium, the most inert of all, was finally adopted as the standard gas used. It imparts greater life to the medication than does air and this fact is particularly noticeable on those products which show the most rapid decomposition.

NEEDLE

The needle is stainless steel with a special designed hub that meets all specifications of the Government. Any length or gauge needle could be used. In the interests of economy, these have been standardized for subcutaneous units at $\frac{1}{2}$'' x 22 gauge, and for intramuscular units at $1\frac{1}{2}$'' x 20 gauge.

The needle cover is made of heavy glass, crush tested at 60 lbs. in order to provide sufficient protection to the unit. The needle cover itself is sealed to the Ampin body through use of a water

insoluble material.

GAS PRESSURE USED FOR INJECTION

Just sufficient gas is used to overcome the resistance of and to push the solution into the tissue. Allowing for variation in tissue resistance, the maximum amount of gas that could possibly be injected is less than 1.5 cc. In subcutaneous injections, this gas escapes as the needle is withdrawn from the tissue. Should the Ampin be improperly used, that is bottoms down, a maximum of 2.6 cc. of gas could be injected.

Since the amount of gas that could possibly be injected is so small, it is likewise almost impossible to achieve an air embolism with an Ampin. A check of the literature reveals that it takes a rather substantial amount of gas to cause a fatal gas embolism in man. Under Queries and Minor Notes, J.Am.Med.Assoc., Vol. 121, No. 5, "Air Embolism," it is stated, "...The danger of air embolism during an intravenous drip must be minimal, since 5 to 10 cc. of air has been injected rapidly in man without producing clinical symptoms..." Other references in the literature corroborate this statement.[3,4]

Tests at several of the leading hospitals of the country show that an Ampin injection does not differ from an ordinary hypodermic injection in regard to tissue damage or in the amount of pain experienced by the patient.[5,6]

Ampins can be used in situations in which there are encountered extremes of atmospheric pressure, such as the reduced pressure found in aircraft at high altitudes and the increased pressure encountered in submarines, since they function without reference to outside pressures.

Since the Ampin contains medication under pressure, there might be the possibility that under extreme conditions the device might explode. In order to obviate this possibility, all Ampins are tested under a vacuum of 26 inches before they are released for use. This is far beyond anything that would be encountered in everyday use.

FREEZING OF SOLUTION NO DETERRENT TO USE

Tests conducted by an independent government laboratory show that if medication freezes in the Ampin, no harm results to the device. These tests further indicate that a frozen Ampin can be palm warmed to liquefaction in an average time of one minute, 45 seconds. The temperature at the time of liquefaction will approximate minus 10 degrees, and at this temperature an injection can be made just as though the Ampin was at room temperature.

AVAILABILITY

Ampins are now available containing various drugs in subcutaneous and intramuscular units. Intravenous units are not yet available. Any medication in liquid form that can be put in an ampul can be put into an Ampin.

This new device has been accepted for advertising by the American Medical Association. It has already been included in the new Formulary of the Bellevue Hospital of New York City. One of our country's leading medical educators has called it "The greatest advance in parenteral therapy since the invention of the hypodermic."

SUMMARY

A new disposable automatic injection device has been described in detail. This device, called an Ampin, is a presterilized unit, ready 24 hours a day, which safely and easily delivers an accurate dose of the contained medication at a uniform pressure. It is so simple to operate that anyone can learn to operate it in a few minutes. It is operated by means of the pressure of the contained inert gas. The medication is sealed in clear, neutral, pyrogen-free glass containers of U.S.P. specifications. There is no danger of making an accidental intravenous injection since the operator can aspirate with the device. There is no possibility of metallic corrosion on the part of the medication and the device is tamper-proof.

Since the unit is presterilized and the needle is uncovered for only a second or two, it is singularly free of the possibility of external contamination so inherent in the assembly of syringes and needles, the transfer of solutions, etc. Since it is disposable, it eliminates the possibility of syringe-transmitted hepatitis.[7,8,9]

All of the foregoing tests and experiments have been passed over rather lightly although they represent the experimental manufacture and testing of almost 200,000 Ampins.

REFERENCES - See Next Page.

REFERENCES

1. Brewer, John H. and Dunning, J. H. Fitzgerald: An In Vitro and In Vivo Study of Glass Particles in Ampuls, J.Am.Pharm.Assoc., Sci.Ed. 36:289, 1947.

2. Hirsch, Harold L., Georgetown University Medical Center, Washington, D. C: Personal Communication, 2-11-49.

3. Moore, R. M. and Braselton, C. W: Injections of Air and Carbon Dioxide Into a Pulmonary Vein, Ann.Surg. 112:212, 1940.

4. Hamilton, Charles E. and Rothstein, Emil: Air Embolism, J.Am. Med.Assoc. 104 2226, 1935.

5. Bush, William; Hubay, Charles, and Barry, Frank M., University Hospitals, Cleveland, Ohio: Personal Communication.

6. Batterman, Robert C., New York University College of Medicine, New York City: Personal Communication.

7. Capps, Richard B; Sborov, Victor, and Scheiffley, Charles S: A Syringe-Transmitted Epidemic of Infectious Hepatitis, J.Am.Med. Assoc. 136:819, 1948.

8. Foreign Letters, Epidemic of Homologous Serum Hepatitis, J.Am.Med.Assoc. 136:209, 1948.

9. Editorial: Syringe-Transmitted Hepatitis, J. Am. Med. Assoc. 139:459, 1949.

* *

Edited by SISTER MARY ETHELDREDA, CHIEF PHARMACIST, SAINT MARY'S HOSPITAL, BROOKLYN, NEW YORK

SELF-TEACHING TESTS IN ARITHMETIC FOR NURSES. By Ruth W. Jessee, R.N., M.A., 122 pages, 8" x 11½", Third Edition, 1949. Published by C. V. Mosby Co., St. Louis, Mo. Price $2.00.

A revision intended to fortify the weak points of the last edition. Problems involving newer drugs have been introduced.

PHARMACEUTICAL SELLING, "DETAILING", AND SALES TRAINING. By Arthur F. Peterson, B.S. 374 pages, 6" x 9-1/4", First Edition, 1949. Published by McGraw Hill Co., Inc. Price $4.50.

Hospital Pharmacists will enjoy and be interested in the chapter entitled "Hospitals and Other Groups". The approach of a salesman or detailman who is familiar with the organization and operation of a hospital along the lines here described should be pleasant association to hospital pharmacists.

FUNDAMENTAL PRINCIPLES AND PROCESSES OF PHARMACY. By Henry M. Burlage, Joseph B. Burt, Charles O. Lee, and L. Wait Rising. 651 pages, 14 x 21 cm., Second Edition, 1949. Published by McGraw Hill Book Co., New York. Price $5.00.

An excellent elementary text in pharmacy revised to conform to the latest standards of the U.S.P. and N.F. Contains useful references for collateral reading from most recent literature following the conclusion of each chapter.

OTHER REFERENCE BOOKS OF INTEREST

STREPTOMYCIN - ITS NATURE AND PRACTICAL APPLICATION. Edited by Selman A. Waksman. Williams and Wilkins, Baltimore, 1949. ix + 618 pp. Illustrated. 15 x 23.5 cm. Price $10.00.

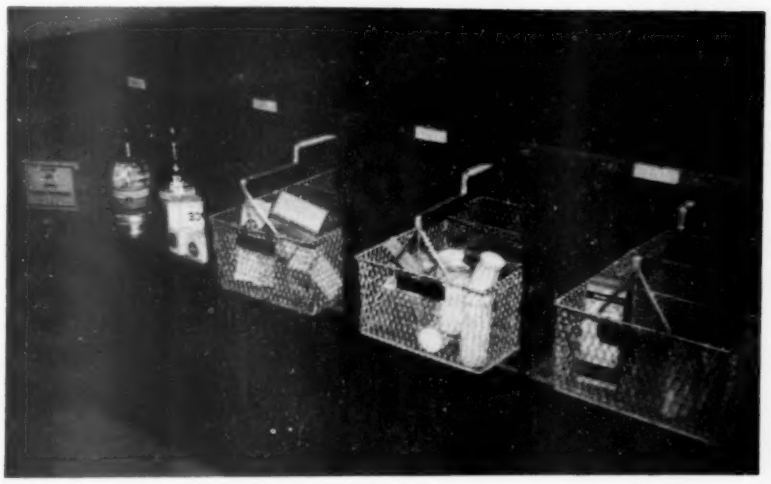
STEDMAN'S MEDICAL DICTIONARY. 17th Revised Edition. Edited by Norman Burke Taylor. Williams and Wilkins, Baltimore, 1949. xiv + 1361 pp. Illustrated. 15 x 24 cm. Price $8.50 with thumb index; $8.00 without thumb index.

THE BRITISH PHARMACEUTICAL CODEX - 1949. Published by Direction of the Council of the Pharmaceutical Society of Great Britain. The Pharmaceutical Press, London, 1949. xxv + 1562 pp. 14 x 23 cm. Price L3. 3.0 (inland postage 1 s).

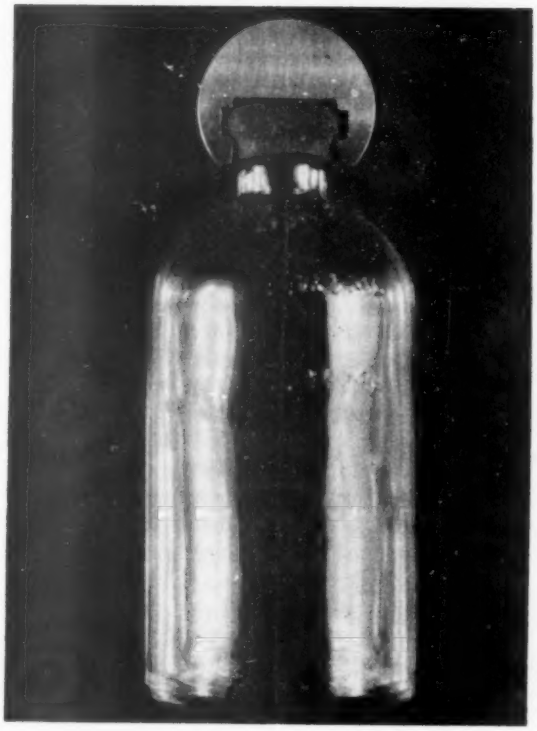
PHARMACEUTICAL COMPOUNDING AND DISPENSING. By Rufus A. Lyman, Editor in Chief. J. B. Lippincott Company, Philadelphia, 1949. ix + 321 pp. Illustrated. 17.5 x 26 cm. Price $6.50.

ALLERGY - WHAT IT IS AND WHAT TO DO ABOUT IT. By Harry Swartz. Rutgers University Press, New Brunswick, 1949. xiv + 210 pp. 13.5 x 21 cm. Price $2.75.

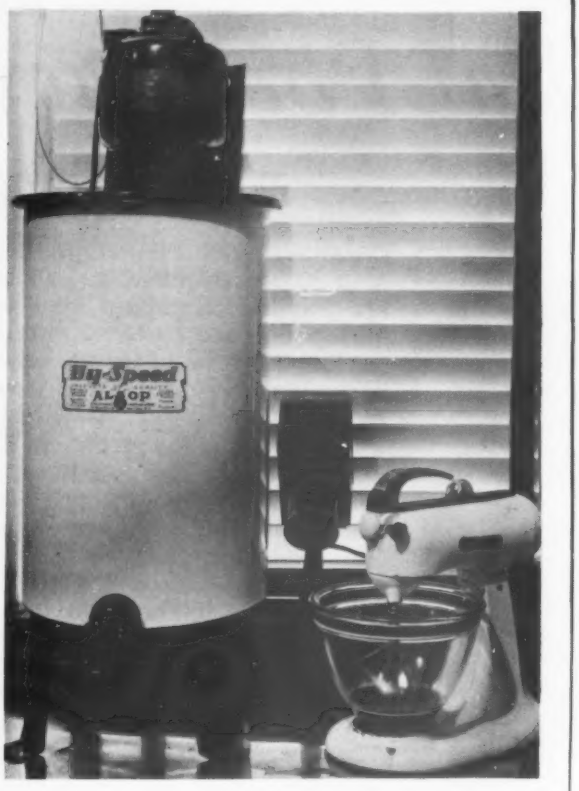
Time-Saving Devices for the Hospital Pharmacy



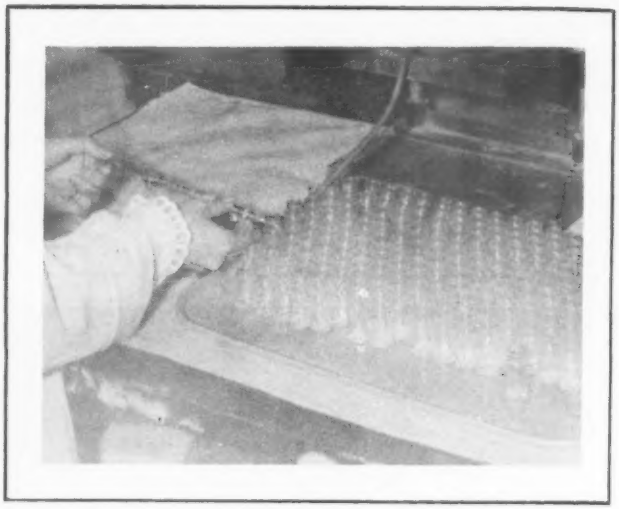
COMBINATION COUNTER, BINS AND STORAGE SPACE . . . This is a combination counter, bins and storage space which reaches across the front of the pharmacy beginning about four feet inside the front door. The top is used for a counter. Underneath the top are nine bins (15" x 15"), one for each unit of the hospital which uses drugs. As the drug orders are filled, they are placed in the proper bin to be picked up by orderlies without interruption of the pharmacy work. Underneath the bins are storage cabinets for miscellaneous items.--Submitted by Charles B. Barnett, St. Luke's Hospital, Jacksonville, Florida.



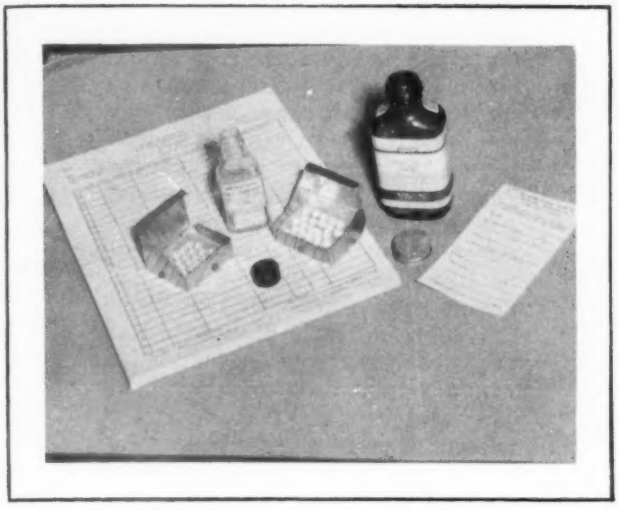
DEVICE FOR HOLDING RUBBER CAP WHILE STERILIZING. . This simple device for holding on a rubber cap while sterilizing is easy to put on and take off. It fits a large number of vial sizes from the 20 cc. penicillin bottle up to the 50 and 100 cc. vials made by Kimball, and the 50 and 100 cc. vial made by T.C.W. Co.--Submitted by Arthur W. Dodds, Lynn Hospital, Lynn, Massachusetts.



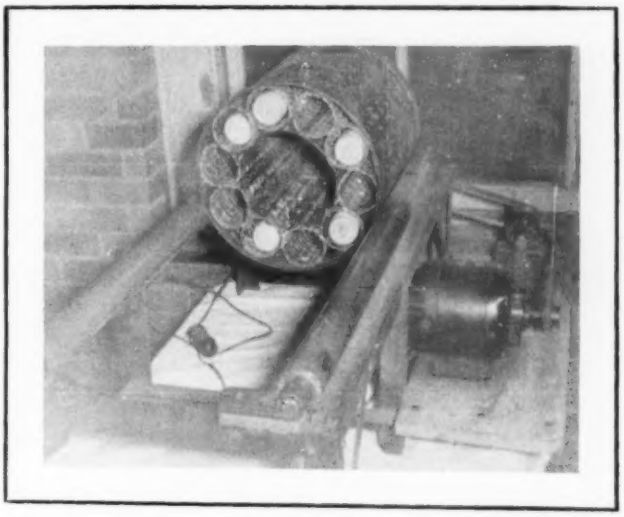
TWO TIME SAVING DEVICES REQUIRED IN HOSPITAL OF 100 BEDS OR LESS . . . Left is a ten gallon glasslined mixing tank with portable electric mixer; right is small kitchen-size electric mixer.--Submitted by J. R. Cathcart, Chester County Hospital, West Chester, Pa.



SEMI-AUTOMATIC PIPETTER . . Our pharmacy is called upon to supply blood specimen bottles containing a small quantity of potassium oxalate and ammonium oxalate crystals. We place 0.5 cc. of solution of proper concentration into the bottle, place the bottle in an oven until all water has evaporated, and then stopper the bottle. The use of a pipette or burette to measure the 0.5 cc. of solution proved to be very time consuming. To overcome this difficulty, we developed the device shown in the illustration. It consists of a 1 cc. Luer syringe to which is attached an automatic three-way valve. A two inch hypodermic needle, the cannula of which is bent to an angle of approximately 60^{o}, is attached to the three-way valve. Attached to the side arm of the valve is a rubber tube leading to the bottom opening of an aspirator bottle, containing the solution. Attached to the large end of the syringe is a stop which permits the withdrawal of the plunger only to the 0.5 cc. graduation. The bottles can be filled just as rapidly as the operator can move the plunger back and forth and move the needle from bottle to bottle.--Submitted by W. Arthur Purdum, Johns Hopkins Hospital, Baltimore.



COUNTERS FOR HYPODERMIC AND ORAL TABLET TRITURATES . . . These are illustrated in two sizes; one for use with small hypodermic tablets and the other for the somewhat larger oral triturates. The counter consists of an aluminum block, approximately 3/8 inch thick, containing twenty-five depressions slightly larger in diameter than that of the tablets to be counted. Except for one corner the aluminum block is enclosed in a piece of stainless steel which has been bent as illustrated. In use, a number of tablets slightly in excess of twenty-five are poured on the aluminum block. The counter is then shaken gently until a tablet has fallen into each of the depressions. The tablets in excess of twenty-five are then poured through the open corner back into the stock bottle. The counter is then turned backward through 90° and the tablets in the depressions fall upon the higher of the four sides, and from here they are poured through the open corner into the vial to be dispensed.--Submitted by W. Arthur Purdum, Johns Hopkins Hospital, Baltimore.



OINTMENT JAR ROLLER . . . Our pharmacy is required to supply the hospital with numerous sterile ointments, many of which contain insoluble solids in suspension. If the jars were removed from the sterilizer and placed on the shelf to cool and congeal, the insoluble solids present would settle to the bottom of the container and ointment base alone would remain above. To prevent this, as jars are removed from the hot air sterilizer, they are placed in the wire mesh cylinders within the metal drum shown in the accompanying photograph. The drum, containing numerous perforations to permit the free passage of air, revolves at a rate of approximately eight revolutions per minute, a rate sufficient to redisperse all solid material during the cooling period and sufficiently slow to prevent any possible centrifugal effect. The rollers on which the drum revolves were made long enough to accommodate a second drum should we outgrow the one now in use.--Submitted by W. Arthur Purdum, Johns Hopkins Hospital, Baltimore.

COMBINATION SOAP MIXER & DISPENSER . . . This is a handy gadget for use wherever large quantities of liquid soap are needed. For the container a 33 gallon metal can or 54 gallon drum with the top cut to proper height may be used. Casters may be welded to bottom as per illustration. Soap container inside the metal can is made from wire mesh soldered at seam and circular piece of sheet iron soldered at bottom. Circle the top with lead pipe, halved. One inch pipe is fitted per illustration with 1/4 inch holes every 3 inches on under side of pipe that crosses bottom of container. This allows the soap solution to flow to the pump. A rotary hand pump 5 to 10 gallons per minute capacity is attached at any desired angle.

To prepare soap solution, place 50 to 75 lbs. of Green Soap in wire mesh basket and add water. Use distilled water if a clear solution is wanted. Soap may be made in any desired consistency by regulating amount of water added. Soap dissolves over night by circulatory displacement.--Submitted by B. R. Cole, San Francisco, Calif.

Timely Drugs

LISSEPHEN - BACI-TROCHE - SAVORFTS - NISENTIL HYDROCHLORIDE - NORISODRINE SULFATE - ANTISTINE-PRIVINE - THENYL-FRED - OLOTHORB - PAMISYL

LISSEPHEN . . . is Abbott's trade name for 3-ortho-toloxy-1,-2-propanediol, a compound which is known in Furope as Myanesin. It has been shown that this compound often produces marked relaxation of muscles in conditions characterized by spasticity due to lesions in the brain or spinal cord. Lissephen may relieve the spasm which occurs in the acute stage of poliomyelitis, and has also been beneficial in cases in which muscle spasm was due to chronic arthritis, bursitis, low back pain, cerebral diplegia, multiple sclerosis in certain stages, and Parkinson's disease.

The suggested dosage for adults is 1 Gm. (four 0.25 Gm. capsules) three to five times daily. For children the dosage is proportionately smaller. If, after a trial of three or four days at this dosage, there is no response to the drug, further use or larger dosage is not likely to be effective.

Lissephen is available in 0.25 Gm. capsules in bottles of 100 and 1000.

BACI-TROCHE . . . is Upjohn's name for bacitracin troches, each containing 1000 units of bacitracin. This preparation is indicated in treatment of Vincent's infection and other mild acute superficial infections of the mouth and throat such as faucial and lingual tonsillitis and pharyngitis caused by bacitracin-sensitive organisms. Bacitroches are available in bottles of 20.

SAVORETS . . . are tablets for oral administration combining sulfonamide therapy. Each tablet contains sulfadiazine, 0.25 Gm., sulfamerazine, 0.25 Gm. and a total of 0.25 Gm. of sulfadiazine and sulfamerazine in equal parts. Savorets are available in packages of 24 tablets from Eli Lilly Co., Indianapolis, Ind.

NISENTIL HYDROCHLORIDE . . . for use as an obstetrical analgesic is available from Hoffmann-LaRoche, Inc., Nutley, N. J. in 1 cc. ampuls containing 40 mg. of 1,3-dimethyl-4-phenyl-4-propionoxy-piperidine hydrochloride (dl-alpha form). Nisentil Hydrochloride is administered subcutaneously.

NORISODRINE SULFATE . . . (Isopropylarterenol Sulfate) is available from Abbott's as a powder, 10 per cent and 25 per cent, for oral inhalation and as a solution 1:100 for use in a hand nebulizer. It has been used for the reduction of bronchospasm in asthma, the 10 per cent powder being indicated for the relief of mild or moderate acute attacks of asthma and the 25 per cent powder in severe attacks of asthma and in status asthmaticus. Dosage and frequency of administration must be cautiously and carefully adjusted to the need and response of the individual patient.

Norisodrine sulfate powder is available in Aerohalor Cartridges containing 100 mg. of the drug, in boxes of 12. The solution is available in 10 cc. bottles.

ANTISTINE-PRIVINE . . . a new nasal solution has been announced by Ciba Pharmaceutical Products, Inc., Summit, N. J. Clinical evidence has shown that the combination of the two drugs is more effective than either drug alone in combating the common cold. The antihistaminic content blocks the congestive action of histamine while the vasoconstrictor, Privine, shrinks the nasal mucosa. Antistine-Privine is available in one ounce dropper bottles.

THENYLFRED . . . is a combination of Thenylene and Ephedrine for use in the symptomatic relief in many allergic conditions, including hay fever, vasomotor rhinitis, urticaria and asthma. Ephedrine exerts a synergistic effect in allergic states when combined with an antihistamine. The central stimulating effect of ephedrine and the central sedative effect of the antihistamine tend to counteract each other and obviate some of the undesired

side-effects of each drug. Tablets of Thenylfred, each containing 50 mg. of Thenylene Hydrochloride and 25 mg. of ephedrine hydrochloride, are available from Abbott Laboratories, North Chicago, Ill.

OLOTHORB . . . is the name given to 0.5 Gm. capsules of polyoxyethylene sorbitan monooleate by Sharp and Dohme, Philadelphia. Olothorb capsules are used in the treatment of malnutrition due to faulty fat absorption. The recommended dosage is at least 6-Gm. doses daily divided into three equal doses given with meals.

PAMISYL . . . (para-aminosalicylic acid) has recently been made available in 0.3 Gm. tablets or in powder form by Parke, Davis and Company, Detroit. It may be used either alone or in conjunction with streptomycin or Promin therapy. Clinical reports indicate that Pamisyl is effective in combating pulmonary tuberculosis in two ways--treatment of acute flare-ups in chronic conditions, and in overcoming the resistance of m.tuberculosis to streptomycin.

According to the clinical report appearing in Diseases of the Chest, (July, 1949), Pamisyl is "a therapeutically useful drug in patients with pulmonary tuberculosis, especially those in whom acute exacerbation of chronic disease has occurred and in whom streptomycin is withheld because of the fear of development of resistance to the latter drug." Other investigators report that resistance to streptomycin is considerably reduced when the antibiotic is given to tubercular patients in conjunction with Pamisyl.

The recommended dosage for Pamisyl is 10 to 15 Gms. per day, usually given in equally divided doses at mealtime and at bedtime. This provides Pamisyl blood levels of 2 to 7 mg. per 100 cc. Gastro-intestinal irritation, the most commonly occurring side effect, can usually be overcome by concomitant administration of an alkali, such as sodium bicarbonate or aluminum hydroxide.

COMMANDER BRIGGS REPRESENTS A.S.H.P. ON PHARMACY MANPOWER COMMISSION

At the organizational meeting of the Pharmacy Manpower Commission in Washington, D. C. on December 1, Commander W. Paul Briggs, vice-president of the A.S.H.P., represented hospital pharmacy. At this organizational meeting, Commander Briggs indicated the need for basic facts on the number of hospital pharmacists in the country and pledged the support of the A.S.H.P.

MICHIGAN CHAPTFR FSTABLISHFS ANNUAL LECTURE AWARDS

At a recent meeting of the Michigan Chapter of the American Society of Hospital Pharmacists the following report of the Committee on Long Range Planning and Policy was presented and accepted by the group. Accordingly the Committee made the following recommendations:

1. That the Michigan Society of Hospital Pharmacists establish an annual lecture award to be presented to an outstanding hospital pharmacist, who, in the opinion of the special committees elected to choose the recipient, has made a significant contribution to hospital pharmacy. It is recommended that the winner of the award be invited to present a lecture on a subject of his own choosing to the Michigan Society of Hospital Pharmacists. It is also suggested that the M.S.H.P. pay the travel and miscellaneous expenses of the recipient from his home to Detroit and return. It is further recommended that this award be known as the Harvey A.K. Whitney Lecture Award in honor of the first chairman of the A.S.H.P. and the individual who, more than anyone else, is responsible for laying the groundwork of hospital pharmacy organization in the United States.

2. The committee also recommends that five of the ten meetings of the M.S.H.P. held during the year be devoted to the following topics:

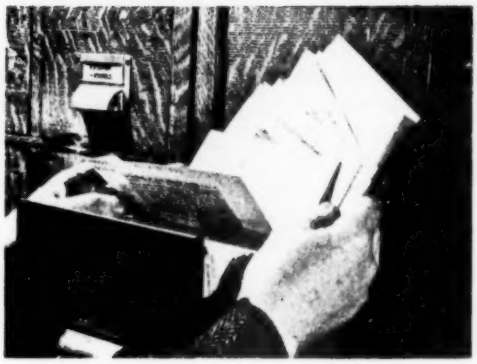
Two meetings to be devoted to a panel discussion on same phases of hospital pharmacy practice.

One meeting to be allotted for the Harvey A.K. Whitney Lecture Award.

One meeting at which a talk on current problems affecting the entire profession of pharmacy is presented. Some examples of these presentations might be "Medical Care Plans", "The Six Year Program in Pharmacy", "Clinic Pharmacies", and "Trademarks of Official Drugs".

One meeting at which at least two hospital pharmacists shall present a resume of the organization, policies and routines of their departments.

Therapeutic Trends



New Trends in Medicine and Pharmacy Include

NEW ULCER TREATMENT - OCTIN IN HEADACHES - CARONAMIDE TO MAINTAIN BLOOD LEVEL OF PAS - COMBINED THERAPY WITH STREPTOMYCIN AND PAS IN TB - ACTH IN ALLERGIC DISEASES - STREPTOMYCIN FOR PERTUSSIS

NEW ULCER TREATMENT

Banthine is the name given to a new drug used to treat ulcer patients. Reported at a recent meeting of the Southern Medical Association, Banthine is said to permit patients to stop their special diets and live normal lives. Chemically, this new synthetic drug is beta-diethylaminoethyl-xanthine-9-carbocylate-methochloride.

This treatment was developed by a group of investigators working at Duke University, Durham, N. C. Taken orally in tablet form, Banthine seems to achieve the same success as surgical treatment of ulcers.

In the experimental studies, twenty patients with complicated ulcers were treated with remarkable results. Pain was relieved and the ulcers healed. The dosage ranged from 50 to 100 mg. four to six times each day. Best results were obtained when patients were treated as early as possible but excellent results have been achieved by giving the drug to long-time ulcer sufferers as well. To date, nearly 100 patients have been treated, some for conditions other than ulcers.

Banthine was supplied by the G. D. Searle Company.

OCTIN IN HEADACHES

Evaluation of Octin (methyl-iso-octenylamine) in the treatment of vasodilating headaches is reported in Proc. Staff Meetings Mayo Clinic 24:565 (November 9, 1949).

It acts as a vasoconstricting agent, its action believed to be due to the fact that it produces stimulation of the sympathetic nervous system and that it acts directly on the muscles of the blood vessels to cause constriction. About fifty per cent of patients may expect complete relief from headaches when Octin is administered intramuscularly.

According to the study, 48 out of 59 headaches were partially or completely relieved and in 11 instances no relief was afforded when Octin was administered intramuscularly. The drug was administered in 0.5 to 1.0 cc. doses in a concentration of 100 mg. per cc. of solution. If no relief from pain occurred, the dose was repeated in thirty minutes. For seven of the headaches, repeated doses of Octin had to be used. Two of these headaches were not helped even after repeated trials of medication.

Orally, Octin relieved either completely or partially, 15 of 26 headaches and there were 11 instances in which no relief was obtained.

None of the patients in the study experienced serious side reactions from the use of Octin. A transient hypertension developed in six normotensive patients treated by the intramuscular route but this was not sufficiently alarming to warrant discontinuance of the drug. However, it is concluded that Octin should not be administered to patients with pre-existing hypertension.

CARONAMIDE TO MAINTAIN BLOOD LEVEL OF PAS

Since p-aminosalicylic acid (PAS) when given orally is absorbed and rapidly excreted in the urine, it was concluded that Caronamide may inhibit excretion of PAS as it does penicillin. This possibility was investigated on patients receiving PAS for pulmonary tuberculosis and reported in Lancet 2:507 (September 17, 1949).

Seven tubercular patients were treated with PAS in daily doses of 15 grams of the sodium salt, three grams being given every three hours. At

the end of the first twenty-four hours of PAS administration, the plasma clearance value for the drug was determined. Caronamide was then administered in doses of four grams every four hours. After another twenty-four hours the plasma clearance value for PAS was found.

Results showed that it is possible by giving Caronamide in conjunction with PAS to obtain higher blood levels than can be obtained by giving PAS alone. Possible therapeutic application of these findings are being investigated.

COMBINED THERAPY WITH STREPTOMYCIN AND PAS IN TB

Previous reports on the combined therapy using streptomycin and p-aminosalicylic acid to treat experimental tuberculosis led investigators at The Mayo Clinic to study the therapeutic action of these drugs combined. Studies published in the Proc. Staff Meetings Mayo Clinic 24:510 (September 28, 1949) show that the combined use of the two drugs produced a therapeutic effect on guinea pigs better than that produced by either drug alone in the same doses, and that the results of the combined treatment were comparable to those obtained with the larger dose of streptomycin.

ACTH IN ALLERGIC DISEASES

During the early experimental work using adrenocorticotropic hormone (ACTH) it was suggested that there is a relationship between hypersensitive state and rheumatic diseases. The possible usefulness of ACTH in the control of hypersensitivity state was first explored in a patient with severe exfoliative dermatitis due to iodine. The unique rapidity of recovery in this critically ill patient stimulated the trial of ACTH in other allergic states. In a second patient treated with ACTH, extensive giant urticaria, joint pains and fever associated with a "serum disease type" sensitivity to penicillin were abolished within twenty-four hours after ACTH therapy was begun.

A preliminary report based on treatment of five asthmatic patients with ACTH appears in Bull. Johns Hopkins Hosp. 85:396 (November, 1949). These clinical studies suggest that ACTH may have an important action in blocking various hypersensitivity reactions. Further observations will be necessary to establish its efficacy in allergic states and the effects of ACTH in other types of hypersensitivity are under study.

Patients treated ranged from 26 to 63 years in age and the duration of asthma from 5 to 23 years. In two patients the asthma was thought due to combined external and intrinsic factors and in the other three it was of the intrinsic type. In several of the patients no more than partial and very temporary relief was obtained by the administration of adrenalin, aminophyllin and ether by rectum. Initial daily dosage varied between 30 and 100 mg. given intramuscularly, divided in equal portions at six hour intervals. Complete freedom from all asthmatic symptoms occurred within one to eight days.

STREPTOMYCIN FOR PERTUSSIS

Twenty-seven patients suffering from severe whooping cough were treated with streptomycin with encouraging results, according to clinical trials reported in J.Pediat. 34:279 (1949). Use of streptomycin significantly reduced the death rate of infants and small children. In a control group of 28 patients, the death rate was more than five times that of the treated group.

Because previous studies indicated that streptomycin is effective against Hemophilus pertussis in vitro, a clinical evaluation of the use of streptomycin to treat pertussis was undertaken. All patients were infants under one year of age with severe cases of the disease. Severity was judged by the presence of conjunctival ecchymoses, encephalopathy, dehydration resulting from severe vomiting, or evidence of pneumonia. Following these studies it was concluded that streptomycin in the dosage administered was of definite value in the reduction of the mortality in whooping cough, especially in the age group of 0 to 8 months and in those cases complicated by pneumonia; and that its effectiveness in clinical therapy of H. pertussis infection parallels its effectiveness against the organism in vitro.

The total daily dosage was 25 mg. per pound of body weight. It was divided into eight equal parts and administered intramuscularly every three hours. The range of the number of days during which patients were treated with streptomycin was one to sixteen with a mean of seven days per patient. In most patients treatment was continued for three to four days after the temperature was normal.

INTERNSHIPS in Hospital Pharmacy

Edited By
O. James Inashima, Senior Pharmacy Intern
Jefferson Medical College Hospital, Philadelphia

During September and October each of the thirty-seven institutions which have internship programs in effect or which have contemplated such a program have been contacted. The list of these institutions was published in this section in the May-June and the September-October issues of THE BULLETIN for the current year. All thirty-seven institutions returned replies and the information has been used to compile a list of internship programs that are currently active.

A list of hospital pharmacy interns currently training under these active programs was also obtained. The information is published here with the hope that persons interested will correspond with these prospective hospital pharmacists, and that interns under these programs will exchange problems and information with each other.

The list is prepared in two parts. The first part includes four institutions currently engaged in a two year concurrent academic and internship program leading to a Master of Science degree in pharmacy with the major in hospital pharmacy. The second part includes formal and informal courses of one year or less than one year duration. There are ten programs included in this category. A number of colleges and hospitals are planning to begin training in 1950. Those institutions and colleges giving academic training without internship are not included in this listing.

SCHOOLS OFFERING A TWO-YEAR INTERNSHIP PROGRAM

State University of Iowa, College of Pharmacy, Iowa City Iowa
Dean: R. A. Kuever

Intern: First Year
William Wayne Tester
Proctor, Minnesota
Montana State University B.S. - 1949

Johns Hopkins Hospital, Baltimore 5, Maryland
Chief Pharmacist: W. Arthur Purdum

Interns: Second Year
Dolores A. Kapusta
91 Fairview Ave.
Campbell, Ohio
Ohio State University B.S. - 1948

James Daniel McKinley, Jr.
101 East 33rd St.
Baltimore 18, Maryland
University of Texas B.S. - 1948

First Year
William Mohn Heller
Broadlands, Illinois
University of Toledo B.S. - 1949

Agnes P. Wajert
21 West Terrace Avenue
New Castle, Pennsylvania
University of Pittsburgh B.S. - 1944

University of Michigan Hospital, Ann Arbor, Michigan

Chief Pharmacist: Don E. Francke

Interns: Second Year
John Kuo-Chieh Liu
594 Hofei Road
Shanghai 25, China
University of Cheeloo B.S. - 1935

First Year
Paul Frederick Parker
1523 South University
Ann Arbor, Michigan
University of Michigan B.S. - 1949

Theodore T. Taniguchi
1424 South Jay Street
Tacoma, Washington
University of Washington
B.S. - 1949

George Joseph Gruber
12310 Farringdon
Cleveland 5, Ohio
Ohio State University B.S. - 1949

Clara Czepnik
122 Southwest 23rd Road
Miami, Florida

Wayne University, Detroit
B.S. - 1949

Jefferson Medical College Hospital, Philadelphia 7, Pa.
Chief Pharmacist: Herbert L. Flack

Interns: Second Year
Edith Bactowsky
1305 Christer Avenue
Schenectady, New York
Union University Albany College of New York B.S. - 1944

First Year
Charles John Keller
589 66th Street
West New York, New Jersey
St. John's University B.S. - 1949

Basil Paul Ketcham
4219 Sheridan Avenue
Des Moines 10, Iowa
Drake University B.S. - 1949

Joseph Presto
19 Homestead Avenue
Naugatuck, Connecticut
Temple University B.S. - 1949

Nicholos Bolos
155 Maple Street
Manchester, New Hampshire
Massachusetts College of Pharmacy B.S. - 1949

SCHOOLS OFFERING
A ONE-YEAR INTERNSHIP PROGRAM

University of California College of Pharmacy Medical Center, San Francisco 22, California
Chief Pharmacist: Jerome Yalon

Intern: LeRoy Lyndell Larrick
Route 7, Box 464
Modesto, California
University of California B.S. - 1949

University of Illinois College of Pharmacy, Chicago 12, Illinois
Asst. Dean of Pharmacy: Frank T. Maher

Intern: Wilfred James Crowell
10510 - 86th Avenue
Edmonton, Alberta, Canada
University of Saskatchewan
B.S. - 1949

Queen of Angels Hospital, Los Angeles, Calif.
Chief Pharmacist: Sister Mary Junilla

Interns: Evangeline R. Browning
727 Broadway
Fargo, North Dakota
North Dakota Agricultural College
School of Pharmacy B.S. - 1949

Joseph Vallani
1016 A. Boynton
Glendale, California
University of Illinois B.S. - 1949

Mercer Hospital, Trenton, New Jersey
Chief Pharmacist: Eugene E. Friedman

Interns: George Forrester Zarr
Hulmeville, Pennsylvania
Philadelphia College of Pharmacy and Science B.S. - 1949

Victor Kozinski
Trenton, New Jersey
Rutgers University B.S. - 1949

Everett Campbell
Cranbury, New Jersey
Rutgers University B.S. - 1950
(Began training summer 1949 - will continue after graduation)

St. Mary's Hospital, Brooklyn, New York
Chief Pharmacist: Sister M. Etheldreda

Intern: Nydia Genevieve Ross
836 Dawson Street
Fordham University B.S. - 1949

Duke University Hospital, Durham, North Carolina
Chief Pharmacist: I. T. Reamer

Interns: Westly Thomas Collier
208 Oak Street
Roanoke Rapids, North Carolina
University of North Carolina
B.S. - 1949

Virginia L. Callahan
311 E. Trinity Avenue
Durham, North Carolina
University of North Carolina
B.S. - 1949

Jean Lyerly Northcott
507 N. Driver Avenue
Durham, North Carolina

University of North Carolina
B.S. - 1948

North Carolina Baptist Hospital, Winston-Salem, North Carolina
Chief Pharmacist: E. W. Rollins

Intern: Ann Carson Hershberg
1910 Elizabeth Avenue
Winston-Salem, North Carolina
University of South Carolina
B.S. - 1949

Mercy Hospital, Toledo 2, Ohio
Chief Pharmacist: Sister Mary John

Interns: Mary Faye Neshkoff
Route 11, Box 560
Toledo 7, Ohio
University of Toledo B.S. - 1948

Ruth Elizabeth Pully
Sandy Hook, Connecticut
University of Connecticut
B.S. - 1949

St. Luke's Hospital, Cleveland, Ohio
Chief Pharmacist: Evlyn Gray Scott

Intern: Elizabeth Jane Cestaric
Box 249, Barrackville, W. Va.
West Virginia University
B.S. - 1949

Freedman's Hospital, Washington 25, D. C.
Chief Pharmacist: John S. Mitchell

Interns: Delores Zeta Douglas
515 Sanford Place
Baltimore, Maryland
Howard University B.S. - 1949

Clarence Elwood Beverley
1810 11th Street, N. W.
Washington, D. C.
Howard University B.S. - 1949

CORRECTION

According to the definition of "Formal" Internship which was used in this section of the last issue of THE BULLETIN, the internship program at St. Mary's Hospital in Brooklyn, New York should have been under the class of "Formal" program.

Since publication of that issue, a more complete description of the course offered at St. Mary's Hospital has been received. The internship offers a detailed period of on-the-job-training with formal lectures and conferences. A definite program of instruction on the operations of a hospital pharmacy is conducted which, upon successful completion of the internship year, the candidate is awarded a certificate of internship signed by the President of the hospital's Board of Directors, the Chairman of the Medical Board, and the Chief Pharmacist and affixed with the seal of the hospital. The hospital now offers a stipend of $125.00 per month with full maintenance; or, if the intern is from the vicinity of the hospital, adjustment is made to the stipend to replace the full maintenance offering.

Anyone interested in this internship program should contact Sister M. Etheldreda, Chief Pharmacist, St. Mary's Hospital, Saint Marks and Buffalo Avenue, Brooklyn 13, New York.

* * * * * * * * * * *

HOSPITAL DRUG ROOM NOT A DRUG STORE RULED IN FLORIDA

The Florida State Board of Health charged a hospital physician with violation of the pharmacy law for dispensing and compounding medicines without registering as a pharmacist. It appeared that the physician kept on hand a supply of drugs compounded by pharmaceutical houses under trade names; which he dispensed on request of his own patients. The Supreme Court of Florida (Div. B), found that the hospital drug room is not a drug store where prescriptions of other physicians may be filled; that the drug room is under constant supervision and control of two physicians lawfully authorized to practice medicine in Florida; that these doctors refer to the orders on the drug room as memoranda rather than prescriptions; and that the order is filled either by the physicians or some one in their constant presence and direction. Therefore the Court concluded that the doctors were exempt under Sec. 465.07 of the State Pharmacy Law, which provides that "Nothing in this chapter shall be construed to prevent a legally authorized practitioner of medicine from practicing, dispensing, compounding for or giving any medicines or poison to his patients in the regular course of his practice as such physician."

NOTES AND SUGGESTIONS

EDITED BY GEORGE L. PHILLIPS

ASSISTANT CHIEF PHARMACIST
UNIVERSITY HOSPITAL, ANN ARBOR, MICHIGAN

FERROUS GLUCONATE SYRUP

A correction should be made in the ferrous gluconate syrup formula previously presented in this column. (Notes and Suggestions, THE BULLETIN, 5:278, Nov.-Dec., 1948) The percentage of sucrose in the original formula (82.5%) apparently represses the solubility of the ferrous gluconate in many instances causing it to gradually form a flocculent precipitate which can only be redissolved by heating. A reduction of sucrose content to 70% appears to remedy this difficulty. The revised formula is as follows:

Ferrous Gluconate	80.0 Gm.
Citric Acid	2.1 Gm.
Peppermint Spirit	2.0 cc.
Sucrose	700.0 Gm.
Distilled Water, to make	1000.0 cc.

Dissolve the ferrous gluconate, citric acid, and 200 Gm. of the sucrose in 450 cc. of the distilled water previously heated to boiling. Cool, add the peppermint spirit and filter through paper until clear. Dissolve the remainder of the sucrose in the clear filtrate and make up to 1000 cc. with distilled water. Mix thoroughly and strain, if necessary, through a pledget of cotton. Each 4.0 cc. contains 0.32 Gm.

DEXTRO AMPHETAMINE PHOSPHATE TABLETS 5.0 mg.

Dextro rotatory amphetamine phosphate tablets (5.0 mg.) can be manufactured for approximately $0.65 per thousand according to the following formula:

Dextro Amphetamine Phosphate	50.0 Gm.
Sitro Dye	1.0 Gm.
Lactose	1029.0 Gm.
Starch	130.0 Gm.
Magnesium Stearate	26.0 Gm.
Talc, purified	65.0 Gm.
Methyl Cellulose 1500 cps 2%	q.s.

Mix the sitro dye and the d-amphetamine phosphate intimately in a mortar. Sieve this mixture through a #30 screen. Then mix carefully with divided portions of the sieved lactose and starch. Granulate with methyl cellulose 1500 cps (2% solution) through a #12 screen. When dry reduce through a #16 screen, add lubricant and compress using a 5/16 inch dye. Each tablet should weigh approximately 0.13 Gm. Formula quantity given is for 10,000 tablets. Tablets of racemic amphetamine phosphate or sulfate can be made using the same basic formula. Sitro dye is available from The National Aniline and Chemical Company, 40 Rector Street, New York, N. Y. Amphetamine salts are available from B. S. Lemke and Company, Inc., 248 W. Broadway, New York 13, N. Y. or Biorganic Laboratories, Inc., 261 Norman Avenue, Brooklyn, N. Y.

URINE SALT TESTING KIT

Following a recent article by Byrant, et al (J.Am.Med.Assoc., 140:670, June 25, 1949) there have been scattered requests for kits or reagents for performing the described quantitative urinary chloride test. Such a kit has been made up as follows:

1. Silver nitrate solution 0.73%
   a. One 60 cc. dropper bottle
   b. One 120 cc. reserve bottle
2. Potassium chromate solution 10%
   a. One 60 cc. dropper bottle
3. One empty 60 cc. dropper bottle for measuring urine
4. Four Kahn tubes in which to perform test.

Amber or green bottles are indicated, of course, for storing the silver nitrate solution.

Slightly scratched Kahn tubes are often available from the hospital serology department at no charge and are perfectly satisfactory for performing this test. The test is, of course, a measure of sodium intake by correlation; hence is disturbed by ingestion of salt substitutes containing chlorides.

A kit such as is described here is available commercially from The Marshall Laboratories, West Chester, Pa.

IMPROVED UNNA'S BOOT

The following formula for the preparation of Unna's Paste or Boot is new in only one respect. The presence of neocalamine powder in place of zinc oxide makes the preparation more nearly match the tint of the skin.

Propylene Glycol	2000.0 Gm.
Gelatin, sheets	750.0 Gm.
Distilled Water	2000.0 cc.
Neocalamine	250.0 Gm.
To make	5000.0 Gm.

In a tared pail, soak the gelatin in distilled water for 15 minutes. Drain off excess water, add the propylene glycol, and heat the mixture until net weight is reduced to 4750 Gm. Then sift in the neocalamine powder and stir until about to gel. Pour into eight ounce ointment jars and allow to set. Store in refrigerator. Soften the paste in hot water when ready to use.

Propylene glycol is used in place of glycerine because of its superior preserving qualities.

DEPILATORY FOR ANIMALS

An effective depilatory formula for use on animals is given below. To use, simply wet area down with water and apply depilatory with tongue blade. After a five minute exposure, wash area with copious amounts of water.

Barium Sulfide	40.0 Gms.
Sodium Lauryl Sulfate Powder	20.0 Gms.
Glycerin	10.0 cc.
Distilled Water not qs	90.0 cc.

Triturate the barium sulfide in a mortar until fine; add the other ingredients and stir until smooth.

FOLIC ACID ELIXIR

Folic Acid	1.25 Gms.
Sodium Bicarbonate	2.4 Gms.
Elixir Isoalcoholic Low qs ad	1000.0 cc.

Allow the sodium bicarbonate to react with the folic acid in approximately 50.0 cc. of distilled water. When reaction is complete (allow 15 minutes) make up to volume with low iso-alcoholic elixir.

DRUG DELIVERY TRUCK

A rugged, low priced delivery truck suitable for delivering prescriptions and ward stock supplies is illustrated in the adjoining photograph. Wooden racks could be made to fit this truck to prevent loss of smaller bottles. For further information write: Shipping Room Suppliers, Inc., 519 Main St., Cincinnati 2, Ohio.

PROPYLENE GLYCOL AS ANTIFREEZE

Propylene glycol is approximately equal to ethylene glycol (Prestone) as a permanent type radiator antifreeze. If you purchase propylene glycol in appreciable quantities for use in your pharmacy you will obtain an approximate fifty per cent savings by also using this same chemical in your auto radiator this winter. A 50 per cent solution of propylene glycol in water protects against freezing to a temperature of -31° F. An antirust such as sodium borate or sodium nitrite should be added to make a concentration of approximately 1 per cent in the radiator.

CURRENT LITERATURE

HOSPITAL MANAGEMENT

October, 1949 - "What the Hospital Administrator Expects of the Hospital Pharmacist" by Robert R. Cadmus, M.D. A paper presented before the Ohio Society of Hospital Pharmacists at a meeting as part of the sessions of the American Hospital Association. The author presents two criticisms and three challenges to the hospital pharmacist.

page 86

November, 1949 - "Report ACTH Produces Definite Improvement in Rheumatic Fever." From a report made at a two day conference in Chicago to which Armour and Company brought representatives of the 45 clinics now investigating the possible uses of ACTH.

page 80

"Some Considerations Involved in Synthesis of Compound E" by C. R. Addinall, Ph.D. A reprint from the Merck Report.

page 82

SOUTHERN HOSPITALS

November, 1949 - "With the Hospital Pharmacist" by Joe Vance. A report on the "highly successful" annual mid-year meeting of the Southeastern Society of Hospital Pharmacists. Contains excerpts from many of the papers.

page 57

December, 1949 - "With the Hospital Pharmacist" by Joe Vance. A review of the present status of hospital construction under the Hill-Burton Act. The author points out the status of hospital pharmacy in the smaller hospitals and urges hospital pharmacists to review the revised floor plans with this in mind.

page 48

MODERN HOSPITAL

October, 1949 - "New Treatment of the Chronic Alcoholic" by C. C. Pfeiffer, M.D. and Llaus Unn, M.D. Presents the three types of therapy for the chronic alcoholic: emetics, to produce a conditioned reflex against alcohol; tolserol, to sedate the shakes without clouding consciousness; and antabuse, which, if carefully used, will safely decrease the alcoholic's tolerance to alcohol.

page 102

November, 1949 - "How to Put Control in Inventory Control" by Charles E. Duncan. Describes general methods which may be applied to any specific instance.

page 73

"Synthetic Vitamin A" by M. J. Schiffrin, M.D. Reports the successful large scale production of synthetic Vitamin A. Explains chemistry, nutrition, uses in therapy, dosage and toxicity.

page 102

December, 1949 - "The Antibiotic of Choice" Reviews various factors in selecting an antibiotic outlining the chemical properties, dosage forms, administration, etc. for penicillin, streptomycin, aureomycin and chloramphenicol.

page 94

AMERICAN PROFESSIONAL PHARMACIST

October, 1949 - "Medical Terminology for The Pharmacist" by John Zugich. Aids to the pharmacist so he can master the every day language of the medical profession by learning a limited number of recurring key word roots. Tables of suffixes and word roots are given.

page 928

POSITIONS in hospital pharmacy

KANSAS . . . Position for woman as assistant pharmacist open in 500 bed general hospital. Salary open, 8 hour day, one day off each week. For further information write to Sister Superior, St. Francis Hospital, Wichita, Kansas.

PENNSYLVANIA . . . Senior Pharmacist; opportunity with Philadelphia ethical pharmaceutical firm for hospital pharmacist with experience in operation of small manufacturing unit. Must have administrative ability and be capable of supervising personnel. Age 25 to 35. B.S. with at least five years experience, M.S. with three, or Ph.D. with two. Send complete personal, educational and professional data to Employment Manager, P. O. Box 7929, Philadelphia, Pennsylvania.

The following openings in hospital pharmacy appeared in the December issue of The Modern Hospital, page 184. Anyone interested in the positions should write directly to the agency indicated. A fee is charged when positions are secured through the services of a personnel agency.

PHARMACISTS--(a) Chief, to take complete charge of pharmacy for 300-bed general hospital with associated professional building now under construction containing offices for 30 physicians. (b) Associate; 700-bed teaching hospital; preferably one qualified to succeed chief upon his retirement. MH12-10 The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11, Illinois.

PHARMACIST--125-bed; Pennsylvania; salary open; maintenance. Medical Personnel Exchange, 4707 Springfield Avenue, Philadelphia 43, Pa.

SWISS PHARMACIST INTERESTED IN POSITION

Dear Sir: In the issue of March 1949 of your journal an article was published on the situation in Hospital Pharmacy in the United States. I am myself a hospital pharmacist at the Zurich Cantonal Hospital, one of the largest hospitals in Switzerland, with about 1500 beds, and have read this article with great interest. Since the end of the war, many of my friends, physicians, were able to work for some time at American hospitals, and as I am intent on gathering new experiences and learning other ways of professional work, I should like very much to work for about one year at a hospital in the United States.

At present I am directing our Compounding Department, comprising three qualified pharmacists and seven unqualified aids. I supervise the small scale preparation of galenicals of all kinds, the distribution of them and the specialties to the wards, and the filling of prescriptions for about 150 - 200 out-patients a day. Besides I have to assist the chief pharmacist in the purchase and selection of specialties and the standardization of medicinals. My department also carries out the information of physicians and nurses on new products and methods and provides new or rare chemicals for laboratories and physicians occupied with scientific work.

I have been working at this place for something more than one year. Before becoming head of my department I had to work through all the other departments of our pharmacy, such as the large scale galenicals department, in which the manufacture of ointments, tinctures, tablets and coated tablets in large quantities is carried out, and also the parenteral liquids department, where I had to operate all the ampul-filling, -sealing and sterilizing equipment.

I am 33 years old and acquired my state certificate in autumn 1944. Then I worked in a public pharmacy during one year. In 1945 I returned to the Pharmacy School as an assistant to the professor, and I received my Ph.D. in the spring of 1948.

Encouraged by your article, I beg to ask you whether you could send my letter to a hospital pharmacist in need of help or give me addresses of such, or any other advice. With my training and experience I should be able to work efficiently at any hospital pharmacy.

I hope that my request does not cause you too much trouble and I shall, of course, gladly pay all the expenses.

Thanking you in advance for your kind assistance I look forward to your answer.

W. Engler, Ph.D.
Pharmacist

Uetlibergstr. 42
Zurich 45
Switzerland

The above letter addressed to the American Professional Pharmacist is reprinted by request.

Organization News

MASSACHUSETTS SOCIETY

The MASSACHUSETTS SOCIETY OF HOSPITAL PHARMACISTS held a regular meeting at the U. S. Marine Hospital in Brighton on Wednesday evening, November 16, with Mr. Joseph Shibel, President, presiding. During the business session a number of changes and corrections in the by-laws and constitution were reviewed. The speaker for the meeting was Dr. E. V. Lynn, Professor of Chemistry at the Massachusetts College of Pharmacy, who discussed Compound E and other recent therapeutic developments.

SOUTHERN CALIFORNIA CHAPTER

New officers of the SOUTHERN CALIFORNIA CHAPTER OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS installed at the November 9 meeting held at Queen of Angels Hospital in Los Angeles, include President Florence Martin; Vice-President Chester Harding; Secretary Richard Slanker; and Treasurer Norma Irish. Reports from the various committee chairmen were received during the meeting and new committees were appointed to serve during the ensuing year.

A motion was passed providing for the Southern California Chapter to give one intern each year, approved by the Executive Committee, a scholarship (not exceeding $50) for the Hospital Pharmacy Academic Course given at the University of Southern California.

MARYLAND ASSOCIATION

THE MARYLAND ASSOCIATION OF HOSPITAL PHARMACISTS held a section on Hospital Pharmacy in conjunction with the ninth annual conference of the Maryland, District of Columbia, Delaware Hospital Association meeting at Hotel Dupont in Wilmington, Delaware on November 15. Mr. M. A. Moscati, president of the Maryland Association, introduced the following speakers: Dr. Noel E. Foss, Dean of the School of Pharmacy, University of Maryland, who spoke on "Manufacturing Control in the Hospital Pharmacy," and Dr. Nathan W. Shock, Chief of Cardiovascular Diseases and Gerontology Section, U. S. Public Health Service, whose subject was "Broadening Horizons in Gerontology". A message from Mr. Herbert Flack, President of the A.S.H.P. was also presented although Mr. Flack was not present.

NORTHERN CALIFORNIA SOCIETY

Twelve new members were introduced at the November meeting of the NORTHERN CALIFORNIA SOCIETY OF HOSPITAL PHARMACISTS. A forum on the new California Hypnotic Act was held with Mr. J. M. Yalon as moderator and the following other members serving on the panel: Kenneth Lewis, Parke Davis Co.; Dwight Oliver, Peralta Hospital; Perry Matsura, Alameda Hospital, and L. L. Jones, Providence Hospital.

During the business meeting reports from the various committees were received and the report of nominations for new officers was received. It was announced that a forum on incompatabilities of newer drugs will be held at the December meeting.

At the October meeting of the Northern California Society, a lecture on the Federal Hospital Expansion Program was presented by Mr. Gordon Cummings who is in charge of the program for the Hospital Section of the State Department of Public Health. During the forum which followed Mr. Cummings' talk, it was agreed that a pharmacist is valuable in the smallest hospital as he can also serve as administrator, purchasing agent or perform other related duties. It was agreed that a committee of the Society should meet with the State Board on Hospitals when problems concerning pharmacies and their construction and operation would be discussed.

GREATER ST. LOUIS CHAPTER

Forty members and guests attended the November meeting of the HOSPITAL PHARMACISTS OF GREATER ST. LOUIS held at the Sheraton Hotel. During the business session Dr. Walter Fredell, President of the local branch of the A.Ph.A.,

discussed the activities of the branch. Included also on the program was an article entitled "What the Hospital Expects of Pharmacists - Good Housekeeping" read by Mr. Norman Hammelman and a film, "Diagnosis and Treatment of Gastric and Peptic Ulcers" sponsored by Wyeth, Inc.

WESTERN PENNSYLVANIA SOCIETY

At the November meeting of the WESTERN PENNSYLVANIA SOCIETY OF HOSPITAL PHARMACISTS Mr. J. Robert Cathcart, a member of the A.S.H.P. Executive Committee, officially accepted the Society as an affiliated chapter of the national organization. The meeting was held at the University of Pittsburgh School of Pharmacy with Mr. Richard Mattern, president, presiding.

The Society was honored to have with them Mr. Cathcart, who is also chief pharmacist at Chester County Hospital, West Chester, Pa. He addressed the group on "Pharmaceutical Equipment", supplementing his talk with films taken at the Chester County Hospital together with a series of slides showing the details of the equipment described.

ILLINOIS CHAPTER

The ILLINOIS CHAPTER OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS met on December 6th at the Chicago Hospital Council. Mr. Samuel Schkolnik, Attorney, Illinois Pharmaceutical Association, discussed "Legal Interpretations of the Laws Governing the Use of Tax Free Alcohol and Narcotics in Hospitals."

Speakers at the November meeting of the Illinois chapter included Dr. Fremont F. Kelsey, Associate Professor, Pharmacology Department, University of Chicago and Mr. Malcolm Hutton, chief pharmacist, Presbyterian Hospital, Chicago, who spoke on "Compound E".

WISCONSIN SOCIETY

Dr. Silas Evans of Marquette University was guest speaker at the October 21 meeting of THE WISCONSIN SOCIETY OF HOSPITAL PHARMACISTS at Milwaukee Hospital. Dr. Evans is well known for his work in experimental medicine, especially on the causes of the most common degenerative diseases such as silicosis, arthritis and arteriosclerosis.

MICHIGAN SOCIETY
Stark - Rogan - Francke - Lester - McCaughan

MICHIGAN SOCIETY

The November meeting of the MICHIGAN SOCIETY OF HOSPITAL PHARMACISTS was highlighted by a panel discussion on "The Therapeutics Committee and The Formulary." Participants in the panel included Mrs. Jane Rogan, Deaconess Hospital, Detroit; Don F. Francke, University Hospital, Ann Arbor; Louis Lester, Harper Hospital, Detroit; Ray McCaughan, Eli Lilly and Co., Detroit; and Paul Cole, Receiving Hospital, Detroit. Points covered in the discussion included the name and function of the pharmacy committee, policy governing admissions and deletions to the formulary, standards used for selection of material used in the formulary, manufacturers' viewpoint and the actual steps which lead to writing a formulary. The reasons for establishing a formulary in the hospital were also discussed and the fact that it is simply a list of suggestions which serves as a guide to the physician was emphasized. A note of caution in the preparation of the formulary was mentioned--that if too muchn exclusion and selection is used, the use of a formulary comes close to the point of a socialized system of medical care.

Plans for a proposed state-wide meeting and convention to be held once a year and conducted on the plan of an institute were discussed. Lansing was suggested as a central location meeting place and committees will be appointed to consider the possibility of holding such a meeting.

Mr. Frank Ruslander, Medical photographer at Harper Hospital spoke at the December meeting of the Michigan Society on "The Use of Photography in Medical Practice". He presented actual slides of photographic records used for teaching purposes within the hospital.

Southeastern Society Meeting
New Orleans - October, 1949

SOUTHEASTERN SOCIETY

Approximately 125 hospital pharmacists and guests attended the semi-annual meeting of the SOUTHEASTERN SOCIETY OF HOSPITAL PHARMACISTS held in New Orleans October 15 and 16. Highlighting the program was the banquet during which Rev. R. F. Grey, New Orleans, was the principal speaker. His subject, "Big Words in the Prescription of Life," was keynoted by "Cooperation and Courtesy" as needed in our every walk of life. Other speakers at the meeting included:

"A Drug Room vs. a Pharmacy Department in Importance to the Hospital" by Melvin Stevens, Business Director, Lake Shore Hospital, New Orleans.

"The Introduction into Hospital Pharmacy from the Retail Field" by Malcolm Claus, chief pharmacist, Baptist Hospital, New Orleans.

"Hospital Economics" by Joseph Hinsley, Assistant Director, Touro Infirmary, New Orleans.

"What the Physician Expects from the Hospital Pharmacist" by Dr. Fdgar Hull, Chief of Staff, Dept. of Medicine, Louisiana State University, School of Medicine, New Orleans.

"What the Nurse Expects of the Hospital Pharmacist" by Sister Florence, Director of Nursing Service, Charity Hospital of Louisiana, New Orleans.

"Professional Services the Hospital Pharmacist Can Render to the Medical Staff" by Miss Adelia Schneider, chief pharmacist, Southern Pacific Hospital, Houston, Texas.

"Recent Views on Polio Virus" by Dr. George Valley, Senior Research Bacteriologist, Bristol Laboratories, Syracuse, N. Y.

"Compound E (Cortisone)" by J. F. Badgett, Special Services Representative, Merck and Co., Rahway, N. J.

"Voodooism in Old New Orleans" by Miss Sylvia Chin-Bing, Pharmacist, Charity Hospital, New Orleans.

Those attending the convention were also given an opportunity to tour Charity Hospital of New Orleans, The Old "Pharmacy Museum" in the "French Quarter" which is maintained by Loyola College of Pharmacy, and other points of interest.

The meeting was sponsored by the Louisiana Society of Hospital Pharmacists and the program was in charge of Miss Valerie Armbruster, Miss Gracie Barr and Mr. Ronald Macke. Mr. Albert P. Lauve is President of the Southeastern Society.

The next meeting of the Southeastern Society will be held in conjunction with the Southeastern Hospital Conference meeting in St. Petersburg, Florida on April 5, 6 and 7, 1950.

FRANK J. STEELE, Chief Pharmacist at the Greenwich Hospital, Greenwich, Conn., was recently appointed a member of the Faculty of Stamford University, (night school), Stamford, Conn. Mr. Steele will lecture and instruct in General College Chemistry and Laboratory Procedure.

ASSOCIATION OF WESTERN HOSPITALS TO MEET

Announcement has been made in regard to the annual convention of the Association of Western Hospitals to be held in the Olympic Hotel in Seattle April 24-27, 1950. The Hospital Pharmacists of the Puget Sound Area in cooperation with the Northern California Society of Hospital Pharmacists will sponsor a pharmacy section at the convention.

NEWS ITEMS

DIVISION OF HOSPITAL PHARMACY POLICY COMMITTFF MEETS

The Policy Committee of the Division of Hospital Pharmacy held a meeting at the headquarters of the American Pharmaceutical Association on Saturday, December 10. The following were present: Herbert L. Flack, Don F. Francke, Albert P. Lauve and W. Arthur Purdum representing the American Society of Hospital Pharmacists; Robert P. Fischelis representing the American Pharmaceutical Association; Robert R. Cadmus representing the American Hospital Association and Sister Mary Adelaide representing the Catholic Hospital Association. Glenn L. Jenkins, president of the A.Ph.A. and one of the representatives on the Policy Committee, was not able to be present. Mr. I. Thomas Reamer, president-elect of the A.S.H.P., and Miss Gloria Niemeyer, Assistant Director of the Division of Hospital Pharmacy, were present by invitation.

A number of matters of pertinent interest to the future of the Division of Hospital Pharmacy were discussed and a full report will be published in a forthcoming issue of THE BULLETIN.

A.S.H.P. FXECUTIVF COMMITTFE MEETS

Through the Division of Hospital Pharmacy of the A.Ph.A. and the A.S.H.P. it was possible to hold an Fxecutive Committee meeting of the Society at the A.Ph.A. headquarters on Sunday, December 11. Those present included: President Herbert L. Flack, Vice-President W. Paul Briggs, Secretary Gloria Niemeyer, Treasurer Sister Mary Junilla, Chairman of the Minimum Standards Committee W. Arthur Purdum, Chairman of the Membership and Organization Committee Walter Frazier and Chairman of the Convention Committee J. Robert Cathcart. One member of the Executive Committee, Mr. William O. Hays, was unable to be present. The following were present by invitation: Dr. Robert P. Fischelis, Director of the Division of Hospital Pharmacy; I. Thomas Reamer, President-Elect of the American Society of Hospital Pharmacists and Don F. Francke, Editor of THE BULLETIN.

Among the subjects discussed were reports from the committees, membership activities, coordination of the A.S.H.P. activities in the Division of Hospital Pharmacy, the possibility of taking advertising and printing THF BULLETIN, program and plans for the 1950 institute on hospital pharmacy, plans for 1950 convention and other matters of interest to the Society. A more complete report will be included in a forthcoming issue of THF BULLFTIN.

SPECIAL COMMITTEE ON PARENTERAL CONTAINERS APPOINTED

President Flack has recently announced the appointment of a special Committee on Parenteral Containers including the following people: Mr. George Phillips, chairman, University Hospital, Ann Arbor, Michigan; Mr. William McElroy, Peoples Hospital, Akron, Ohio; Sister Mary John, Mercy Hospital, Toledo, Ohio; Mr. Albert P. Lauve, Mercy Hospital, New Orleans, Louisiana; Mr. Russell Lovell, Akron City Hospital, Akron, Ohio; and Mr. William P. O'Brien, Touro Infirmary, New Orleans, Louisiana.

BETTER PATIFNT CARF THROUGH COORDINATION

"Better Patient Care Through Coordination" is the title of an article recently published by J. R. McGibony, M.D., and Louis Block, Dr.P.H., in Public Health Reports 64:1499 (November 25, 1949). This planning guide refers to the present situation existing in hospital care in the United States and outlines the administrative services for providing a coordinated plan in an effort to provide better patient care.

Development of the various hospital services in the fields of clinical services, administration and education are covered. Every phase of hospital care is reviewed with suggested steps which might be taken to improve facilities and to cut down operating expenses through better planning.

Referring to pharmaceutical services in hospitals, it is pointed out that about five per cent of the total cost for hospitalization comes under pharmaceutical service. At this time less than 40 per cent of all general hospitals have a full-time pharmacist. The situation in hospitals of less than 100 beds is somewhat more acute since a very small percentage provide pharmaceutical service. To meet the existing situation, the guide makes the following suggestions in regard to providing better pharmaceutical service in all hospitals:

1. Formation of an active pharmacy committee.
2. Development of a simplified formulary.
3. Guidance on purchase, storage, inventory, and control of drugs.
4. Simplification of standardized forms and records.
5. Proper narcotics and barbiturates control.
6. Manufacturing.
7. Professional and administrative audit of pharmaceutical activities.
8. Space, equipment, and staffing requirements.
9. Conferences and educational activities pertaining to pharmacists and pharmaceutical services.

To carry out the overall plan, it is suggested that a regional council be set up to serve as a guide in hospital planning. Members of the council would include representatives of member hospitals, physicians and public-spirted lay persons. The staff of consultants and advisors should also include a pharmacist.

1950 INSTITUTE ON HOSPITAL PHARMACY

The 1950 Institute on Hospital Pharmacy is scheduled to be held in Ann Arbor, Michigan, from June 19 to the 23rd inclusive. Present plans call for providing quarters for the enrollees as well as meeting accommodations in one of the dormitories of the University of Michigan. The organizing committee for the Institute includes Mr. Don E. Francke, Chairman; Dr. Albert C. Kerlikowske, Director of the University Hospital, Ann Arbor; Dr. Robert P. Fischelis, Secretary of the American Pharmaceutical Association; Mr. I. Thomas Reamer, President-Elect of the American Society of Hospital Pharmacists; Dr. Charles T. Dolezal, Assistant Director of the American Hospital Association and Miss Gloria Niemeyer, Secretary, Assistant Director of the Division of Hospital Pharmacy.

Suggestions from members of the Society concerning topics they would like to have discussed at the Institute will be welcome. The suggestions should be addressed to Mr. Don E. Francke, Chief Pharmacist, University Hospital, Ann Arbor, Michigan.

CHA PLANS 1950 INSTITUTE

The Catholic Hospital Association is making tentative plans to sponsor an institute on hospital pharmacy prior to the annual convention of the Association, which will be held in Milwaukee, Wisconsin early in June, 1950.

DR. AUSTIN SMITH APPOINTED EDITOR OF AMA JOURNAL

On the resignation of Dr. Morris Fishbein, Dr. Austin Smith has been appointed Editor of The Journal of the American Medical Association by the organization's Board of Trustees. Dr. Smith is well known to hospital pharmacists since he has spoken at our meetings and institutes many times.

He becomes Editor with a background of training and experience particularly fitted for this position. A graduate of Queen's University Faculty of Medicine, Kingston, Ontario, Canada, he has the graduate and postgraduate degrees, M.D., C.M. and M.Sc. (Med.). As an undergraduate student he was associated actively with teaching and research. When he graduated he turned to additional training in clinical medicine and to further research and teaching appointments. Since graduation he has held teaching positions at three medical schools, and he still holds the title of Professorial Lecturer in the Department of Pharmacology, University of Chicago. His memberships in research organizations testify to his interest in and knowledge of the prevention of illness and the treatment of those who are sick.

Dr. Smith has been associated with the headquarters office of the American Medical Association since February 1940. As Secretary of the Council on Pharmacy and Chemistry and Director of the Division of Therapy and Research of which the Council is a part, he has had a unique opportunity to observe modern medical problems. As an active participant in administrative committees at American Medical Association headquarters he has seen and helped solve many of the problems today confronting the Association. Since February 1949, Dr. Smith has been Assistant Editor of The Journal in preparation for his present assignment. Through his many activities the Editor has become well known in medical, pharmacal and educational

circles and particularly to the drug and similar industries. He also is known for the several books and many articles that he has written on medical topics. As a speaker, especially before groups raising funds for research, he has been in demand.

DR. ROBERT T. STORMONT TO AMA

Replacing Dr. Austin Smith as Director of the Division of Therapy and Research and Secretary of the Council on Pharmacy and Chemistry of the American Medical Association is Dr. Robert T. Stormont, who has recently been Medical Director of the Food and Drug Administration. He has served as a member of the American Medical Association's Council on Pharmacy and Chemistry for several years. Dr. Stormont received his M.D. from the University of Chicago and also holds a Ph.D. in pharmacology and a B.S. in chemistry from the University of Wisconsin.

Dr. Erwin F. Nelson will replace Dr. Stormont as Medical Director of the Food and Drug Administration. He has been Chief of the New Drug Section of the Food and Drug Administration's Division of Medicine since 1947.

A.H.A. PHARMACY COMMITTEE

Appointments to the American Hospital Association's Committee on Pharmacy have been made recently by Dr. Edwin L. Crosby, Chairman of the Council on Professional Practice. Members of the committee for the current year are: Robert R. Cadmus, M.D., University Hospital, Cleveland 6, Ohio, Chairman; Don E. Francke, University Hospital, Ann Arbor, Michigan; Hans S. Hansen, Grant Hospital, Chicago 14, Illinois; Worth L. Howard, The City Hospital of Akron, Akron, Ohio; W. Arthur Purdum, Johns Hopkins Hospital, Baltimore 5, Md.; and John J. Zugich, Grace-New Haven Community Hospital, New Haven 11, Conn.

DON E. FRANCKE COMMISSIONED IN U. S. PUBLIC HEALTH SERVICE

Appointment of Don E. Francke as a special consultant to the U. S. Public Health Service was announced recently. Commissioned in the grade of Pharmacist (equivalent to the Army rank of Major) in the inactive Reserve Corps, Mr. Francke will be called upon by the Service from time to time to serve as a consultant on certain phases of hospital pharmacy.

Mr. Francke has served as editor of this publication for six years and is a member of the Council of the American Pharmaceutical Association. He is presently a member of the Policy Committee of the Division of Hospital Pharmacy of the A.Ph.A. and the A.S.H.P. and he represents the hospital society on the Joint Conference Committee on Federal Food, Drug and Cosmetic law problems.

Appointments of this nature are another example where the Pharmacy Section of the Service has acquired the professional assistance of outstanding authorities in order that the highest standards of pharmacy operation may be maintained in all Marine Hospitals and the numerous other activities of the U. S. Public Health Service.

HOSPITAL SURVEY AND CONSTRUCTION ACT AMENDED

An act known as the "Hospital Survey and Construction Amendments of 1949" was signed by the President on October 25, 1949, becoming Public Law 380 of the 81st Congress.

Under the terms of the new legislation, the amount of Federal grants to the states is increased from $75 to $150 millions dollars annually and the period during which allotments can be made is extended from June 30, 1950 to June 30, 1955. In addition, a new formula has been developed which permits a Federal contribution ranging up to 66.6 per cent of the total construction costs for new hospitals as against a contribution of 33.3 per cent under the original law.

The new legislation also provides for Federal grants totaling 1,200,000 dollars a year for a research program looking toward coordination and improvement of hospital services. In making grants for the research projects, emphasis will be placed on means by which specialized types of service can be provided for small hospitals as well as large hospitals. Grants made under this provision of the amendment may extend over a 5-year period and the responsibility for implementing this phase of the program has been delegated to The Division of Medical and Hospital Resources of the Public Health Service. Results of the projects will serve as useful sources for data on professional and administrative problems.

A.M.A. REPORTS ON HOSPITAL SERVICE IN THE UNITED STATES

In the past year the Council's annual census of hospitals showed a new high in the utilization of hospital service in the United States. The total of

16,422,772 admissions in 1948, an increase of 593,260 in comparison with the previous year, exceeded also the earlier record of 16,257,402 in 1945. While increases occurred in both the governmental and nongovernmental groups the expansion was not uniform throughout the hospital field. The federal hospitals, for example, reported a reduction of about 100,000 admissions; yet the governmental hospitals, as a group, showed a net increase of 86,147 and the nongovernmental hospitals 507,113. The greatest increase in service was in the general hospitals which reported 15,160,062 admissions or 92 per cent of all patients admitted in 1948. The psychiatric hospitals admitted 305,000, an increase of 13,046, while the tuberculosis hospitals had 105,588 admissions compared with 99,080 in 1947.

The volume of hospital service is also reflected in the average daily census of 1,217,154 reported in 1948. Included in this total is an average census of 437,590 in the general hospital group, a figure representing 36 per cent of the daily patient load in all registered hospitals. The psychiatric hospitals, with only 2 per cent of the admissions, reported an average daily census of 664,399 indicating that nearly 55 per cent of the occupied hospital beds are continuously utilized for psychiatric care. In the field of tuberculosis, the daily census of 66,484 represents approximately 5 per cent of the total hospital load.

It should be noted that the number of admissions reported in the present survey does not include hospital births, which last year totaled 2,794,281 compared with the all-time record of 2,837,139 in 1947. Again the general hospitals reported the greatest number, 2,715,645, or 97 per cent of all hospital births.

The number of hospitals registered by the American Medical Association in 1948 was 6,335, including 4,589 classified as general hospital services. The total capacity is 1,423,520 beds with approximately 72 per cent in the governmental hospitals and 28 per cent in the nongovernmental group. The general hospitals have 576,459 beds, the psychiatric hospitals 691,499 and the tuberculosis division 81,993. Last year the over-all hospital occupancy rate was 85.5 per cent, the general hospitals reporting 75.9 per cent and the psychiatric hospitals 96.1. The high percentage of beds occupied in psychiatric hospitals is an indication of the urgent need for additional beds in this field as many of the hospitals are now required to operate well beyond their normal rated capacity.

--J.Am.Med.Assoc. 141:696 (Nov. 5) 1949.

GOOCH APPOINTED TO V.A.'S PHARMACY DIVISION

John M. Gooch, formerly chief pharmacist of the Wadsworth Veterans Administration hospital in Los Angeles, California, has been appointed chief of the technical section of V.A.'s pharmacy division in Washington, D. C., E. Burns Geiger, chief of the pharmacy division, announced recently. He replaces W. C. Anderson, who resigned to attend the School of Hygiene and Public Health of Johns Hopkins University, where he will spend one year majoring in hospital administration.

Gooch was graduated with a B.S. degree from the University of Washington in 1930. From 1930 to 1942 he was a pharmacist in professional retail pharmacies in Seattle. He entered the Army in November, 1942, as a pharmacist at the Camp Crowder Station hospital, on detached service from the 140th Station Hospital. He served overseas with the 61st General Hospital, and was discharged from service in October, 1945. He returned to a prescription pharmacy in Seattle, where he remained until April, 1947, when he joined the V.A. regional office in San Diego, California, as a pharmacist. He transferred to the Wadsworth V. A. hospital as chief pharmacist in January, 1948, remaining there until November, 1949, when he came to Washington, D. C., to head the technical section of the pharmacy division.

Gooch is a member of the American Pharmaceutical Association, the American Society of Hospital Pharmacists and the Southern California Chapter of the A.S.H.P.

The technical section, of which he is chief, reviews and makes recommendations on requests for new drugs; informs V. A. pharmacists throughout the country of new drug therapy and other technical developments, and maintains contact with other Government agencies and with pharmaceutical manufacturers.

RFSEARCH GRANT TO UNIVFRSITY OF ILLINOIS

The University of Illinois College of Pharmacy has been awarded a $1,500 grant by Sharp and Dohme, Philadelphia, Pa., for the purpose of establishing a research investigation of the method of controlling drugs in hospitals.

At the present time, there is no common procedure practiced by the pharmacies in hospitals in this country. It is hoped this study may result in a more economical delivery of drugs to the patient.

NEW MEMBERS

CALIFORNIA

Ozawa, Fumiko, 2823½ So. San Pedrost, Los Angeles (A)
Perla, Mrs. Florence, 233 So. Linden, Beverly Hills (A)

COLORADO

Sister Mary Rosalia (Schwartz), 415 Quincy, Pueblo

DISTRICT OF COLUMBIA

Hanson, Kenneth Emerson, 4813 V Street, S.E.

ILLINOIS

Root, Charles Theodore, 1201 S. Main St., Jacksonville (A)
Sladky, Louis F., 9300 Oakley, Chicago (A)
Young, Paul R., U. S. Naval Hospital, Great Lakes

IOWA

Carlson, Beverly Jean, College Hospital, Ames
Cooper, Gerald J., 1912 Court, Sioux City

LOUISIANA

Claus, Malcolm F., 6919 Louis XIV, New Orleans
McNamara, John C., 1908 Robert St., New Orleans (A)
Mang, Herbert Joseph, 135 So. Alexander, New Orleans
Noullet, Clothilde Beaud, 2555 Acacia St., New Orleans (A)

MASSACHUSETTS

Arzoomanian, Estella, 315 Main St., Charlestown 29
Robert, Laurent F., Fruwirth Avenue, Feeding Hills
Tucci, Ralph G., 53 Standish St., Cambridge

MICHIGAN

Anderson, Eleanor, 12850 Rutland, Detroit 27
Gruber, George Joseph, 100 Forest, Ann Arbor (A)
Ksendzik, Nina Katherine, 13222 Caldwell, Detroit
Matsuda, Chieko, 634 W. Warren, Detroit 1
Taniguchi, Theodore T., 100 Forest Avenue, Ann Arbor (A)
Wallace, William John, 100 Forest, Ann Arbor (A)

NEW JERSEY

Nicholson, Joseph Anthony, 1115 W. State St., Trenton (A)
Nielson, Paul E., 100 Broadway, Hillsdale

NEW MEXICO

Bell, Peter F., Los Alamos Hospital, Los Alamos

OHIO

Cole, Adelbert Charles, 136 E. Como Ave., Columbus 2 (A)
Nicholas, Ruth M., 437 Caroline, Youngstown
Sister Helen Mary Flynn, Good Samaritan Hospital, Dayton
Sister M. Bernadette, 1450 Hawthorne, Columbus 2

OKLAHOMA

Sister Mary Fidelia, St. Francis Hospital, Holdenville

PENNSYLVANIA

Benen, Doris F., 130 So. 60 St., Philadelphia 39
Frank, Harvey P., 43 and Kingsessing, Philadelphia (A)
Hersh, Jean Gloria, 936 N. 19 St., Allentown (A)
Mattern, Richard H., 4614 E. Willock, Pittsburgh
Sister M. Gonzales Duffy, Pride & Locust, Pittsburgh 19

SOUTH CAROLINA

Benson, Robert L., RFD #4, Columbia

TEXAS

Carpenter, Glenn A., 425 E. Church, Beaumont (A)

WISCONSIN

Krause, Arthur J., 58 Scott St., Oshkosh
Lemberger, Jr., Max A., 324 E. Wisconsin Ave., Milwaukee
Messner, Patricia Ann, 1355 N. Prospect, Milwaukee
Sister M. Felicitas, OSF, 707 S. University Ave., Beaver Dam

CANADA

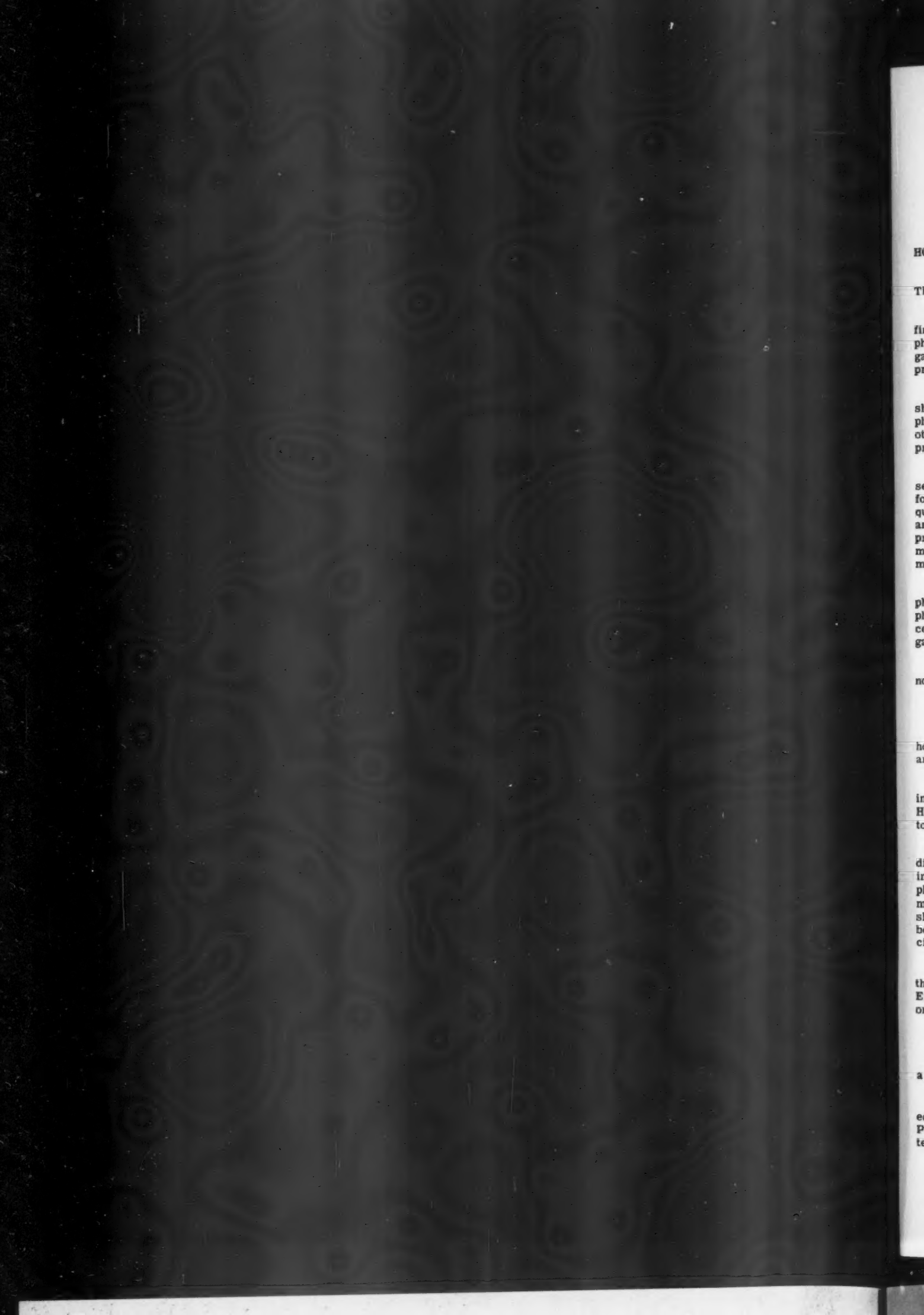
Morrison, Finlay Angus, 5902 Clement Road, Vancouver, B. C. (A)

SUBSCRIPTION PRICE TO THE BULLETIN

Subscription rates for THE BULLETIN of The American Society of Hospital Pharmacists effective January 1, 1950 are as follows:

$4.50 per year for domestic subscriptions
$ .75 for single copies, domestic.

$5.00 per year for foreign subscriptions
$ .85 for single copies, foreign.



American Society of Hospital Pharmacists

Affiliated With The

American Pharmaceutical Association

AS REVISED APRIL 1949

CONSTITUTION

Article I. NAME OF ORGANIZATION AND DEFINITION OF HOSPITAL PHARMACIST.

Section 1. NAME. The name of this organization shall be The American Society of Hospital Pharmacists.

Section 2. DEFINITION. A hospital pharmacist shall be defined as any legally qualified pharmacist practicing the art of pharmacy in a hospital, clinic or dispensary or actively engaged in the administration or supervision of pharmaceutical procedures in hospitals, clinics or dispensaries.

Article II. - OBJECTIVES. The objectives of the Society shall be to improve and extend the usefulness of the hospital pharmacist to the institution he serves, to the members of the other health professions with whom he is associated, and to the profession of pharmacy by:

FIRST - Establishing minimum standards of pharmaceutical service in hospitals, in order to provide benefits and protection for the public health which it will receive by the skill and art of qualified hospital pharmacists and to insure for the future an adequate supply of such qualified hospital pharmacists by providing a standardized hospital training for four-year pharmacy graduates who have elected a specialized hospital pharmacy course.

SECOND - Providing for interchange of information among pharmacists by encouraging initiative in the development of new pharmaceutical technics, and by maintaining a close pharmaceutical contact between hospital pharmacists and those engaged in general pharmaceutical practice.

THIRD - Aiding the medical profession in extending the economic and rational use of medicaments.

Article III. - MEMBERSHIP

Section 1. (a) ACTIVE MEMBERS of this Society shall be hospital pharmacists as defined in Article I, Section 2, and who are members of the American Pharmaceutical Association.

(b) HONORARY MEMBERS may be elected from among the individuals who are especially interested in hospital practice. Honorary members shall not pay dues, nor shall they be eligible to vote or to hold office.

(c) ASSOCIATE MEMBERS may be elected from among individuals other than hospital pharmacists, who, by their work in the health services, the teaching of prospective hospital pharmacists, or otherwise contributing to hospital pharmacy, make themselves eligible to membership. Associate members shall not be entitled to hold office or to vote. Associate members must be members of the American Pharmaceutical Association.

Section 2. - Application for membership shall be received by the Committee on Membership and shall be acted upon by the Executive Committee on the recommendation of said Committee on Membership.

Article IV. - OFFICERS

Section 1. OFFICERS. The officers of this Society shall be a President, a Vice-President, a Secretary and Treasurer.

Section 2. TENURE OF OFFICE. All officers shall be elected annually for a term of one year. The President and Vice-President shall hold office for not more than two consecutive terms.

Article V. - AFFILIATED CHAPTERS. A local or regional group of hospital pharmacists numbering ten or more active members of the Society may become an affiliated chapter of the American Society of Hospital Pharmacists upon approval of the Executive Committee of the Society.

Article VI. - AMENDMENTS. Every proposition to alter or amend this Constitution shall be made by two members at an annual meeting of the Society and shall be voted upon by ballot of the members of the Society by mail at least two months subsequent to the annual meeting. All ballots to be eligible for voting must be post-marked within thirty (30) days of the date of the ballot.

BY-LAWS

Chapter I. - ELECTION OF OFFICERS

Article 1. - NOMINATION OF PRESIDENT, VICE-PRESIDENT, and TREASURER. At the first session of each annual meeting of the Society, the President shall appoint a Committee of three members who shall nominate two candidates for each of the following offices: President, Vice-President, and Treasurer. The Committee shall present its nomination at the final session of the annual meeting at which time additional nominations may be made from the floor.

Article 2. - BALLOTS. The names of the candidates shall be submitted by mail to every active member of the Society by the Secretary within two months after their nomination, together with a request that the member indicate on the ballot enclosed his choice of candidates for the offices to be filled and to return the same by mail within 30 days of the date printed on the ballot.

Article 3. - COUNTING OF BALLOTS. The ballots received within 30 days of the date printed on the ballot are to be sent by the Secretary to the Board of Canvassers, which shall consist of at least three active members of the Society, who shall count the votes of the dues paid members only. The Board of Canvassers shall certify to the Secretary the results of the election. The Secretary shall notify the successful candidates and the results of the election shall be published in THE BULLETIN of the American Society of Hospital Pharmacists.

Article 4. - INSTALLATION OF OFFICERS. The officers thus elected by a plurality of votes, together with the Secretary elected as hereinafter provided, shall be installed at the final session of the annual meeting of the Society following their election.

Article 5. - ELECTION OF SECRETARY. The Secretary of the Society shall be nominated by the Executive Committee and elected annually by the House of Delegates of the Society.

Chapter II. - DUTIES OF OFFICERS.

Article 1. - PRESIDENT AND VICE-PRESIDENT. The President, or in his absence, the Vice-President, shall preside at all meetings. He will appoint all committees not otherwise provided for and shall be ex-officio member of all committees. He shall prepare a President's address to be presented at the first session of the annual meeting of the Society following his installation.

Article 2. - SECRETARY. The Secretary shall keep minutes of the sessions of the Society and maintain a roll of its members. He shall notify individuals of their appointment to committees, notify members of the time and place of all meetings, and conduct the correspondence of the Society. He shall present a written report of his work to the annual meeting of the Society.

He shall collect the dues of the members. The Secretary shall be a member and secretary of all standing committees.

Article 3. - TREASURER. The Treasurer shall receive and keep account of all moneys received by the Society in the form of dues or remittances and shall disburse them at the direction of the Executive Committee or at the direction of the Finance Committee.

Article 4. - DELEGATES. The delegates to the Society are to be selected by affiliated chapters of the Society. Each affiliated chapter with 50 or less active members is entitled to one delegate. Each affiliated chapter with more than 50 active members is entitled to two delegates. Delegates shall be members of the House of Delegates of the Society.

Chapter III. - EXECUTIVE COMMITTEE. The Executive Committee shall consist of the Officers of the Society and the Chairman of each standing committee. It shall meet on the call of the President of the Society, shall have supervision over the expenditures of all funds of the Society, and shall be empowered to act for the Society during the period between annual meetings.

Chapter IV. - HOUSE OF DELEGATES. The House of Delegates shall consist of the Executive Committee of the Society and of delegates from the affiliated chapters of the Society. It shall meet on the evening prior to the first session of each annual meeting. The House of Delegates shall assist the Executive Committee in the formulation of policy, and the Delegates shall present a report in writing to their respective affiliated chapters concerning the conclusions reached.

Chapter V. - MEMBERSHIP DUES. The membership dues shall be $3.00 per year payable in advance. Membership in the Society and the obligation for dues will continue from year to year unless a member's resignation, signed by the member is received by the Secretary prior to the end of the year for which dues have been paid. Membership dues are payable and due on the anniversary date of the time the member first joined the Society. Any member in arrears for dues for one year shall cease to be a member of the Society, provided that at least two weeks before his name is removed from the rolls, the Secretary shall send him a written notice of his delinquency, together with a copy of the by-laws pertaining to the subject. Such a person may be reinstated as a member provided his arrears have been paid and payment of current membership dues is made.

Chapter VI. - STANDING COMMITTEES. There shall be five standing committees of the Society; each consisting of three members appointed by the President of the Society, with the approval of the Executive Committee.

Article 1. - CONVENTION COMMITTEE. The Convention Committee shall assume responsibility for the program at the annual meeting of the American Society of Hospital Pharmacists; shall assist in the sponsoring of programs for State and National conventions of Medical, Hospital and Pharmaceutical Associations, working in conjunction with the program committees of the respective state hospital pharmacy societies, and maintain a reservoir of suitable material representative of Hospital Pharmacy for display at these various conventions; and shall assist in the formulation of the program for the annual Institute on Hospital Pharmacy.

Article 2. - MEMBERSHIP AND ORGANIZATION COMMITTEE. The Membership and Organization Committee shall seek desirable members. It shall receive applications for membership in the Society. It shall develop such plans as may be found desirable to establish state, district and local affiliated groups of hospital pharmacists. The Membership and Organization Committee shall make such recommendations to the Executive Committee as are advisable.

Article 3. - MINIMUM STANDARD COMMITTEE. The minimum standard committee shall develop standards for hospital pharmacy training and specialized hospital pharmacy courses. It shall develop minimum standards for pharmacies in hospitals.

Article 4. - FINANCE COMMITTEE. The Finance Committee shall consist of three members: The President, the Secretary and the Treasurer, who may, without further action, pass on all accounts or appropriations.

Article 5. - COMMITTEE ON PHARMACISTS IN GOVERNMENT SERVICE. The Committee on Pharmacists in Government Service shall assemble current information pertaining to problems affecting pharmacists in government service. Periodic review shall be made by the Committee of duties performed by hospital pharmacists in government service for the purpose of recommending methods conducive to the improvement of hospital pharmacy service. The findings and recommendations of the Committee shall be transmitted to the Director of the Division of Hospital Pharmacy, who shall be responsible for obtaining evaluation of the findings and recommendations for the purpose of resolving and implementing them, either through the National Committee on the Status of Pharmacists in Government Service, or other indicated organizations.

Chapter VII. - AFFILIATION. The Society shall be affiliated with the American Pharmaceutical Association and subject to such rules and regulations as are or may be provided by that Association to govern its affiliates.

Chapter VIII. - PUBLICATIONS. THE BULLETIN of the American Society of Hospital Pharmacists and the JOURNAL of the American Pharmaceutical Association, Practical Pharmacy Edition, shall be the official publications of the Society. All papers presented at the annual meeting of the Society shall be submitted to the Editor of THE BULLETIN for review and if suitable, for publication. Papers may be released for publication elsewhere on the approval of the Editor of THE BULLETIN.

Chapter IX. - ANNUAL MEETINGS. Annual meetings of the Society shall be held in conjunction with annual meetings of the American Pharmaceutical Association.

Chapter X. - QUORUM. Fifteen members shall constitute a quorum for an annual meeting.

Chapter XI. - ORDER OF BUSINESS. At stated or adjourned meetings, business shall proceed in the following order:

1. Call to order
2. Roll call of delegates
3. Reading and adoption of minutes
4. Appointment of committees
5. Ratification of Special Committees
6. Receipt of reports and other communications to the Society
7. Receipt of resolutions, all of which shall be in writing and submitted at the first session of the Society
8. Unfinished business
9. New business
10. Report of resolutions committee
11. Report of nominating committee
12. Installation of officers
13. Adjournment

Chapter XII. - AMENDMENTS. Any proposition to alter or amend these by-laws shall be submitted at the first session of an annual meeting of the Society and voted upon at the next session of the same annual meeting.

UNIVERSITY OF MICHIGAN
GENERAL LIBRARY
ANN ARBOR, MICH.

Section 562, P. L. & R.
U. S. POSTAGE
PAID
Ann Arbor, Michigan
Permit No. 222

THE BULLETIN
American Society of Hospital Pharmacists
American Pharmaceutical Association
2215 Constitution Ave., Washington 7, D. C.
RETURN POSTAGE GUARANTEED

Index photographed at the
beginning for the convenience
of the microfilm user.